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BITS & BYTES

September 1986 $2.25

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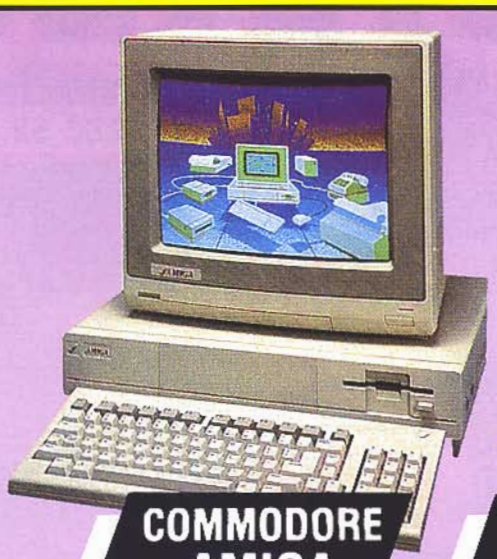

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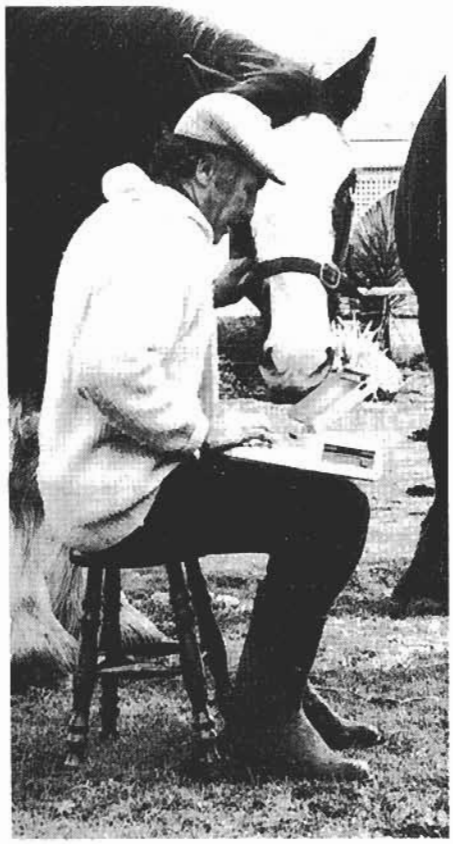

From the horse's mouth – computers in the rural sector

COLUMNS

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HARDWARE REVIEWS

SOFTWARE REVIEWS

FEATURES

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English spelling from new BOS/Speller

A new spelling checker for the BOS/Writer V1.3 has been released, based around a disk copy of the 160,000 word Concise Oxford Dictionary under licence from Oxford University Press. BOS/Speller is thus intended to have the advantage for New Zealand users of preferring English to American spelling.

In addition to the main vocubulary, up to nine different user glossaries, each containing up to 2,000 words, may be defined. These might contain company, product and personnel names or specialist terms which are correct but not yet found in the Concise Oxford Dictionary, and can also define particular words as 'questionable', or found in the main dictionary but probably errors if they occur in the user company's documents.

Under the heading "Eliminates typos and misspellings", BOS says BOS/Speller "scans a document and notes as possible errors words which are not found either in the dictionary or in a user-defined glossary, repeated words not seperated (sic) by a punctuation mark (eg 'the the'), and words defined as questionable in the current glossary."

More power Prices down

IBM has announced new prices for the lower end of its computer range; however, it's difficult to compare these with previous prices as the products are not formatted in quite the same way.

The new prices include packages formatted with more memory and more power. For example, the PCXT, formerly 10Mb and 256Kb RAM, costing $8331, now sells at $6533 and incorporates 20Mb fixed disk and 512 Kb RAM. All up, with a monochrome display, printer and display adapter and DOS 3.2 the and new XT will retail at $7,953.

The new PCAT with 30Mb fixed disk, the 8 MHz 80286 microprocessor, 1.2Mb diskette drive, new 101 keyboard and 512Kb RAM memory will retail at $11,512. The old, 20Mb version was selling at $12,339.

The PC JX, including a colour monitor, full function keyboard and DOS2.1 now retails at $3,659 and the new portable, the PC Convertible will retail at $4,974.

The PCG system with one 5½ inch drive and 256Kb memory, a monochrome display, printer and display adapter, DOS 3.2 will sell at $5382.

AT power in a portable?

When is a laptop not a laptop? Toshiba's new compact personal computers released last month pose the question. Both the 256Kb T2100 and related 640Kb T3100 (expandable to 640Kb and 2.6Mb respectively) are described by Toshiba as laptops, but their reliance on mains power separate them from the machines normally associated with complete portability.

The philosophy behind these new

portables, according to Stephen Hague, national sales manager for Toshiba (Australia) Computer Products Division, is that the majority of the market is mobile executives and professionals who want portability but can't rely on batteries.

"They are desktop machines that don't take up all of your desk top," he says. "The hardest job in marketing these is convincing people you do not have to have a big box for an AT."

Both models have gas plasma display and built-in floppy disk drive, while the T3100 also boasts an integral hard disk. Its 80286 processor and switchable 8MHz/4MHz speed make it a full AT computer, according to Toshiba.

A full review will appear next month.

DSIR to hold CAD seminar

A one-day seminar is planned by DSIR's Auckland Industrial Development Division for November 5, aimed at helping users achieve better productivity of their personal computer-based CAD systems.

To be held at the Sheraton Hotel, Auckland, the seminar is aimed at both current users and potential purchasers of PC CAD systems. Speakers will include CAD specialists from technical institutes, DSIR and private industry, and will include Albert Sedlmayer, the Auckland naval architect who designed the tourist catamaran Pride of Auckland using a CAD system.

Clone prices down in UK

A cheap IBM PC compatible is now available in the UK for less than £500. The new Osborne Genius from Future Management, with 256Kb memory, one floppy disc drive, AT-style keyboard, monochrome monitor and DOS costs £495 plus VAT.

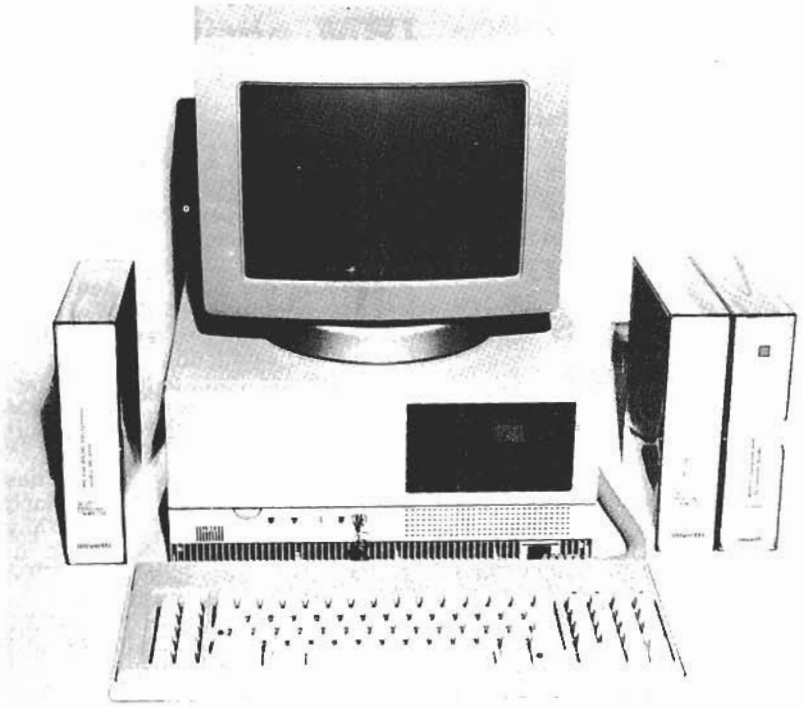
However, the best value among the PC clones is said to be the Bondwell 34, with two floppies and 640Kb for £599 plus VAT, and the Bondwell 36XT adds a 20Mb hard disc drive for a total of £999 plus VAT. Further price falls are expected, and PC clones are already selling for under $500 in the USA.

IBM actively fights counterfeiting

In a joint operation with local police, IBM recently uncovered a large counterfeiting case in Taiwan. At the Ling Yih plant 170 sets of ellegedly counterfeited IBM PC-AT cabinets were discovered, with a further 600 sets found in a shipping container just about to leave the factory. All were taken to the IBM warehouse in Yang Mei to await court action.

Meanwhile, IBM New Zealand has announced that Computer Broking Services Ltd has agreed not to do any acts or sell any products which infringe IBM's copyrights in the IBM BIOS and MEGA BIOS chips, or copyrights in the design of its PC/XT computer cabinet. Computer Broking Services has acknowledged that it may have infringed IBM's copyright in both the basic input/output system chip and the design of the cabinet through the sale of its unbranded XT PC.

"It is our intention to protect IBM's



OLIVETTI
throws its AT in the ring

by Rob Eckford

Despite the entrenchment of the Intel 8088 CPU in the New Zealand personal computer scene, a new standard has emerged to challenge that set by the now over three-year-old IBM PC. The new trend, pioneered by the IBM PC AT, has raised consumer expectation to require faster processing and large amounts of RAM with which to run complex management applications.

Manufacturers have not been slow to rise to the new expectation, with 17 distributors in New Zealand offering on an average three different models in the Intel 80286-based range. Number 18 has now entered the "AT race" with the Olivetti M28. At what odds?

The profile of the typical PC AT across the whole market seems to be an 80286-based machine with 512Kb RAM, a single 1200Kb floppy disk and a 20Mb hard disk. Obviously many different tunes are played on the AT fiddle, hence the prices range from around $8,000 to over $23,000 for single user microcomputers that, on the surface, appear to do the same job.

The trend-setter IBM PC AT+ sits in the lower end of the middle bracket at about $13,000. To succeed in this market, a manufacturer would have to be seen to be offering something more in performance for something less than average price. After my two-week assessment of the Olivetti M28, I feel that this has been achieved.

First impressions on opening the cartons (ex-factory) were favourable: a very well-packaged product, backed up by professional looking manuals, that took only 10 minutes to have up and running. At this stage I would also like to mention the very able and friendly assistance with various queries in the period of assessment from Olivetti manager David Frood. With such good local backing for this product, the future looks good for user support.

Overall, the Olivetti gives the impression that a great deal of user consideration has been put into the design. Little points have been thought out, such as easy access to all switches, adequate cable lengths, ventilation ports at the front and back of the system unit (allowing things to be stacked against the sides) and decent sized shift key, all petty annoyances when neglected. Another point in the Olivetti's favour is the small footprint of the system unit, although vertically it appears bulky.

On running up the system, my first and lasting impression was speed. Having used an 8088-Z 8.OMHz system running KMAN DBMS applications over the last six months, I was interested to see how the M28 would cope with the requirement for memory intensive overlaying and a heavy demand on disk access.

It fairly flew through the code. As an example, a sorting routine taking some 16 seconds to run on the 8088-Z based XT was completed in under 10 seconds on the Olivetti. This measure of time saving was evident in all applications that I tried.

The review model was supplied with 512Kb of RAM, which is expandable to 1Mb on the motherboard. The base system comes with a single 1.2Mb floppy disk and 20Mb slim line integrated hard disk. The configuration can be enhanced by adding an integrated 20Mb streaming tape unit, while the hard disk capacity can be expanded to 40 or 70 Mb. The product literature boasts seven 16 bit and 8/16 bit expansion slots, but on inspection, only five are free in the standard configuration. This is somewhat less than the IBM standard.

The casing of the system unit can be easily removed by loosening three nuts. There is plenty of space within the cabinet and the overall impression is of solid engineering. For such an obviously robust chassis, the system unit is remarkably light in weight.

The keyboard is also lightweight and has a good feel, although the non-standard positioning of the Escape and Alt keys left me a little puzzled to begin with. A nice touch was the inclusion of two neat little cards with the documentation containing the video editor commands for the function keys, but I could not find anywhere convenient on the keyboard to place them.

Over the two weeks I used the Olivetti M28, I ran every piece of IBM PC software that I could lay my hands on, including PC tools, Norton Utilities, Flight Simulator, Gatto, Wordstar and KMAN. All were loaded from 360KB IBM format floppy disk

Name	Olivetti M28
Manufacturer	Olivetti
Microprocessor	80286
Clock speed	8 MHz
RAM	512 KB. Expandable to 1MB on motherboard.
ROM	Bootstrap
Disk Capacity	1.2 MB floppy and 20MB hard disks
Keyboard	86 keys including 10 function keys
Ports	One centronics and one serial port
Slots	7 (5 full length). 5 (3 full length) available
Display	640 x 400 pixels (monochrome hi-res) 320 x 200 pixels (4 colours)
Standard Features	Clock calendar with battery back-up Mouse controller Sound control IBM PC AT compatible
Price	$13,048
Expansion	40/70 MB Hard Disk Streaming Tape Memory expansion board (2Mb) 80287 arithmetic unit (8 MHz) 10-Net Network attachment kit

and gave no problem with compatibility, except that some graphics in PC Tools seemed to work differently to that expected. Overall I would have to give the machine a compatibility rating of 99.9%.

The current price of the Olivetti M28 in the configuration as tested is $13,048. However, David Frood pointed out that marketing strategy would be to offer the base machine at some 10 per cent less than the IBM entry equivalent. This policy has affected the price of the M24 which is coming from the new South Korean factory, but the M28 is still sourced from Italy and Olivetti would like to see the product settle for a while before making final adjustments.

Still, the Olivetti M28 should be a very viable offering in today's market, and for those who have a requirement for an easily expandable, solidly engineered and powerful microcomputer, I can really recommend this offering. ▢

MICRONEWS

intellectual property from misappropriation and misuse," says Basil Logan, IBM New Zealand's chairman and managing director. "The present settlement illustrates our determination to do this."

NZ company land big newspaper deal

Adata Software, the Wellington high-technology software company, has achieved what it calls an "absolute milestone" with a deal to supply its products to one of the world's largest newspapers, the *Los Angeles Times*.

Adata's chief executive John Moriarty says his company has been marketing the specialist system known as Exsys in the USA for over a year with good results, "but the Los Angeles Times sale really puts us on the map in North America." The newspaper will use the software package for data modelling and prototyping activities for its sales and circulation functions – a considerable task with its circulation of more than one million.

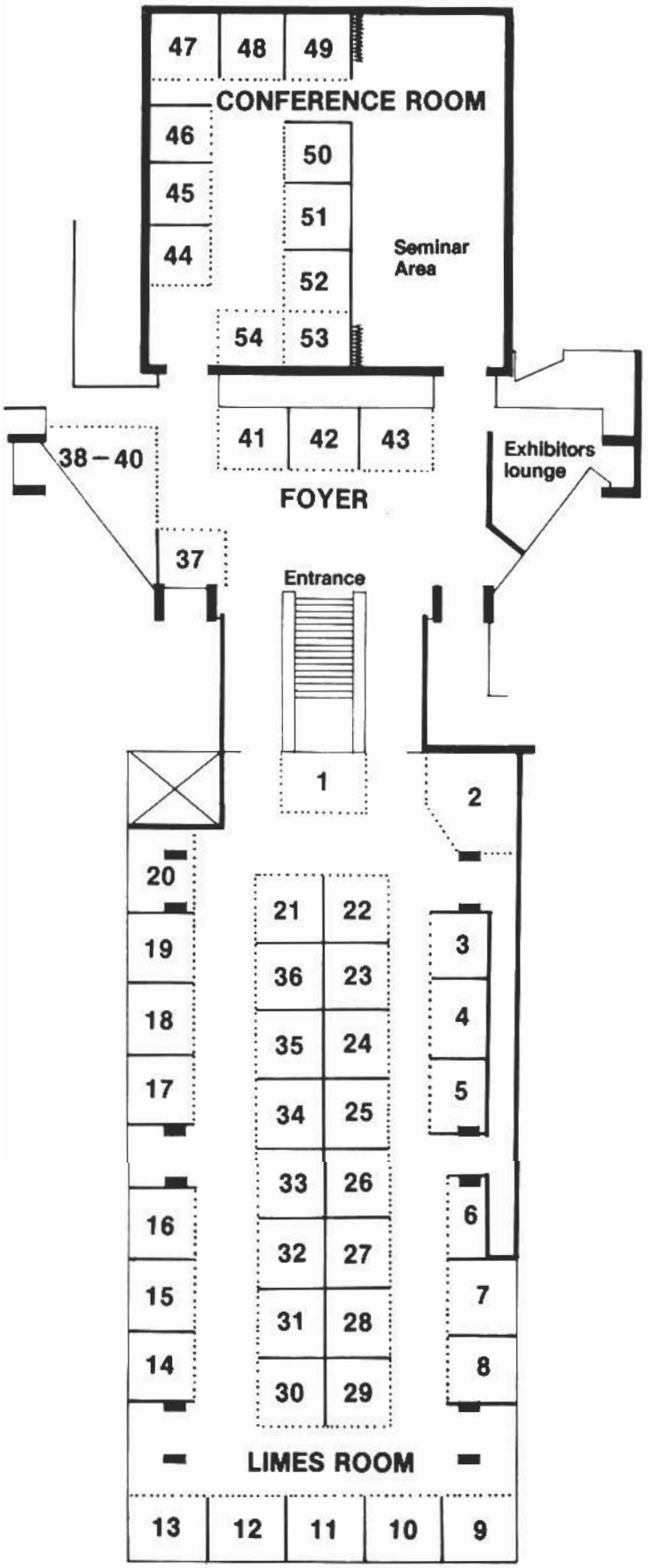
Commodore buys software company

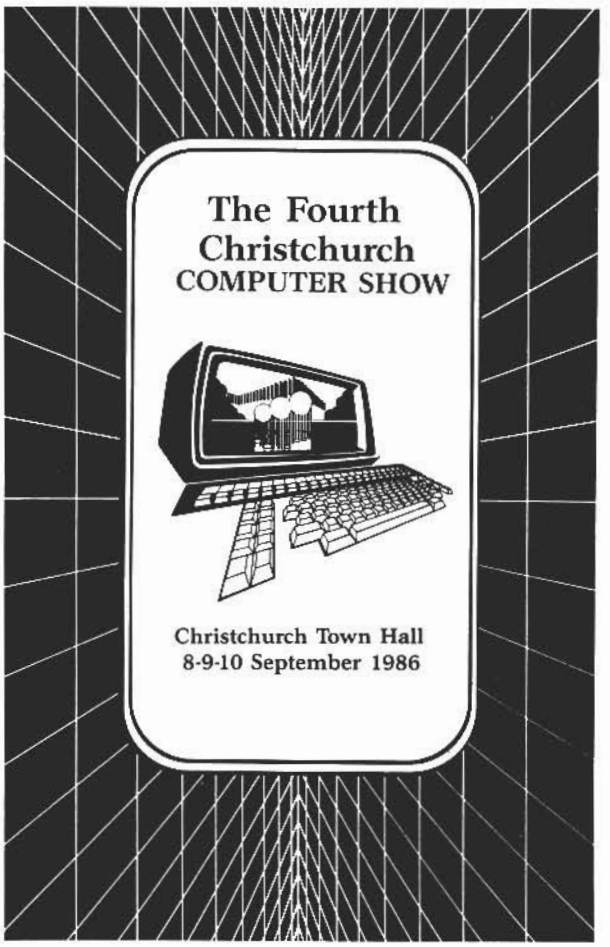
Commodore has acquired all the shares in the Auckland software house Proton Electronics (NZ) Ltd in a move announced in late July.

According to the Commodore directors, the acquisition will provide their company with a vehicle for product diversification outside its mainstream computer hardware operations. Proton Electronics was formed four years ago and has been involved in the development and marketing of software and accessory products both in NZ and overseas. It recently acquired Meridian Systems, which has been developing business software for Commodore and MS-DOS computers.

1986 CHRISTCHURCH COMPUTER SHOW

SEPTEMBER 8, 9 & 10





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9-11	Whitcoulls Ltd
12	SICOM Business Systems
13	Commodore & Computers
14-15	University Bookshop (Canty) Ltd
16	Interface Design
17-20	White Knight Computer Solutions
21-22	Moore Paragon
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28	Datacom Equipment Ltd
29-30	Cable Price Engineering
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NEW RELEASE: Macintosh Database

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SOFTWARE: Amiga CAD, GST, GEOS for C64, Profax for IBM/compatibles.
NEW RELEASE: 64c, Dynamic CAD for Amiga.

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NEW RELEASE: IBM Side Car

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ALSO: Books on the Microbee.
NEW RELEASE: Microbee/Mitac.

Micro Business Systems Ltd

336 St Asaph Street
Christchurch
791-449
PERSONNEL: John Sullivan, Denis Cooch, Nigel Spiers, Tony Dixon.
PRODUCTS: Commodore PC Series II, Televideo AT, Personal Mini, Novell 286B File Server.
SOFTWARE: Novell, GNET/ARCNET/ V-LAN, Dataflex, CBA Business System; Essence, Profax Professional accounting, pride II printers system, tourplanner.
NEW RELEASES: Televideo "TELE-CAT" AT, Commodore PC Series II, Novell, Essence, Tourplanner.
ALSO: Free advice.

MoS Computer Software & Supplies

P.O. Box 46177
Herne Bay
Auckland
(09) 760-086
PERSONNEL: Mike Ridgway, Tim Manning.
PRODUCTS: Lotus, Paradox, WS2000, IFPS, Harvard, VP Planner, Games and many others, NEW Ericcson Portable.
SOFTWARE: all products available.
ALSO: consumables, diskettes & diskholders 49-95.
NEW RELEASE: Mace utilities and new products direct from the States.

NZ Post Office

Telecom Sales
Box 4545
790-265
PRODUCTS: computerphone, starnet.

Professional Systems International Ltd

137 Kilmore St,
Colston House
60-064
PRODUCTS: PSI XT/AT series Microcomputers, Fujitsu printers, Panasonic printeirs, computer furniture.
SOFTWARE: Profax, Businessware, Carbon Copy, BCL.
NEW RELEASE: New 'Point of Sale' system developed in DATAFLEX.

Sicom Business Systems

66 Oxford Tace
Christchurch
796-259
PERSONNEL: Ronnie Harris, Leanne Coneybear, Colin Maynell.
PRODUCTS: Nimbus job costing, accounting, Versacad.

Solstat Industries Ltd

P.O. Box 13-183,
32 Sheffield Cres
Christchurch
PERSONNEL: Ron Blakemore, John Campbell, Steven Cox, Nigel Lloyd.
PRODUCTS: Dysan, Seagate, OMEK, Scientific Micros, Maxstor, Lapine, IQ Technologies, Bugtrap, DMA-Ricoh, Nortronics, Wangtek.
NEW RELEASE: Lapine 20 megabyte 3½" Winchester
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– Seagate ST251 40 megabyte slimline drive with 40 millisecond access time.

TA-Triumph-Adler (NZ) Ltd

209 Victoria St
Wellington
(04) 851-013
PERSONNEL: Mrs P Brash, Mrs N Lomax
PRODUCTS: TA Micro Computers, P30-02D, P60.01, TRD 7020 printer.
SOFTWARE: Script, Retailer & General Applications, Wordperfect.
NEW RELEASE: The retailer – provisionally.

The White Knight Ltd

194 Gloucester St
Christchurch
797-811
PERSONNEL: Warren Janett, Bob Radley.
PRODUCTS: IBM Compatibles, IPC XT, XT-Turbo, Plus CAT. Uni-Bind.
SOFTWARE: A1 Typist, Generic-Cad, Able 1, TAS-PLUS, TAS ACcounting, Portfolio manager, metastock, clickart.
ALSO: Pearl Diskettes.

Tower Computing

2nd fl, the Tower Building,
Cnr Salisbury & Montreal Sts
61-275
PERSONNEL: Graham Thompson, Campbell Egan, Meru Stevens.
PRODUCTS: Hewlett Packard Vectra PC, HP Plotters, H.P. Laserjet series printers, H.P. Portable.
SOFTWARE: Click-Art for P.C., Paradox Database System, accounting software – attache, Power, Ascent, Sybiz.
ALSO: Medical and hospital systems.

University Book Shop

University Drive,
Ilam
Christchurch
488-579
PRODUCTS: Recent and backlist publications from leading publishers of computer books, for educational, business and hobby uses. Books not on display at the show can be supplied from the bookshop or ordered.

Whitcoulls

Private Bag
Christchurch
797-541
PERSONNEL: Cambell Botting, STeve Baker.
PRODUCTS: Apricot, Tandon, Atari, Brother, Sybiz.
SOFTWARE: Sybiz Accounting, Microsoft, Builders packages, Deer & Goat Data.
NEW RELEASE: Apricot XENI.

SEMINAR PROGRAMME

(Continued on page 60)

PIPS 111

The business user's dilemma

by John Highland

Almost without exception, the small business computer users that I have spoken to are unsatisfied with the business administration programs they are operating. These comments have referred to off-the-shelf software, to specially modified off-the-shelf software and, in some cases, to tailor-made packages.

Those who feel their software "does the job" with regard to a specific task can see that their company is largely under-computerised as programs they really want are not available, and the cost and communication problems associated with commissioning tailor-made packages are to be avoided.

One of the reasons for this dissatisfaction is that the modern business practice is in a continuous state of evolution. How anyone administers a business today differs to the methods of three years ago, and will obviously differ from those of even a year's time. Regulations constantly change. GST needs to be accommodated. The line of business has expanded or completely altered.

The software they have is inflexible and cannot keep pace with change. It satisfied a period of their evolutionary process, but the passing of time has made it redundant.

I became aware of this dilemma not long after I formed my own practice as a building design consultant, and had to make decisions with regard to organising the company's administration.

The solution I chose was to become computer independent, my own programmer. Basic, Cobol or Pascal was out as I could not afford the time required to master any of these and still carry on with business.

I selected *PIPS III*, Sord Computer's Plan Information Processing System, and almost three years down the line I can say I am still excited about it.

For a start, it does not need programming. From the very day I unpacked it I was able to make my own tables of data, perform calculations in them, and print them out. Within a week I was sorting data over several pages, searching for data based on my own conditions and doing calculations transversing numerous tables on the disk. For the first year I needed nothing more than to utilise PIPS III in this manner.

To explain, PIPS III is a collection of programs that carry out specific business activities and are put into operation by issuing simple commands. These cover basic tasks of making, manipulating and storing tables; to more high-powered tasks such as sorting, searching (with up to 20 conditions) and processing data; to specialised tasks such as translating data to graphs, converting tables to invoices, summary pages of reports and letters; and of course transmitting and receiving data via telephone modems or closed circuit.

As the commands are flexible and have a wide application, anyone can computerise his or her paperwork through a combination of these easy to learn comands. The computer is operated by simple dialogue. The user gives a command, the computer asks for specifics and then executes this task. The number of PIPS III commands has been kept down to about 50, a number small enough to remember with no problem. However, each command represents a unit of work which, when put together with other commands, can take care of all daily business routines.

The PIPS III calculation commands are simple and powerful. It can, for example, find the maximum or minimum value of a string of numbers, or calculate its average, or even calculate sub-totals within the string. The string of numbers need not even be on one page. Three-dimensional calculations over several pages are possible.

Data can be sorted, combined, deleted, updated, or modified with a single PIPS command. Further, these commands can be executed one after another in succession to carry out complicated operations.

Data input once can be used for a variety of purposes. For example, the sales invoice commonly used in offices can be displayed on the screen. Using this as a guide, the operator can enter information under the appropriate headings. As the operator is typing, this data is stored in external memory. The data can then be printed onto the actual sales invoice and sent to the customer. The data can be retrieved again and used for making a record of the total number of sales to a particular company or for monthly billings, or other tasks.

The beauty of PIPS III is that the operation carried out can produce an endless variety of results and operations, quickly and effectively. PIPS III is an open structured program system that gives anyone the flexibility and freedom to computerise to a specific work pattern.

Further, a single command controls data reception and transfer, thereby allowing users in different offices to share the same data.

Automatic processing

Truly exciting is the ability to automate repetitive operations. In PIPS III, each command carries a unique function. Using them one by one can take care of simple tasks, but stringing them together in different combinations can take care of extremely complex business operations. The standard programming controls of VARIABLES, FOR... NEXT loops, IF... THEN... ELSE decisions, GO TO and GO SUB redirections are just a few of the tools available to convert your PIPS III operations into a fully automated tailor-made program.

Herein lies the beauty. A manager can prepare the procedures and operations, which can from then on be carried out by even a complete computer novice. Some of the programmes that I have prepared are:

1. Invoicing: Answering screen prompts, a detailed time sheet is prepared and printed out. This is then automatically converted into a letter style invoice complete with envelope. Further, a yearly register of invoices is updated to keep track of debtors and payments, complete with running totals and monthly subtotals. Having investigated GST, I will soon expand this program to accommodate it.
2. Company Accounts (also private): Answering screen prompts, all debits and credits are entered and coded. The data can therefore be sorted and totalled up both in a monthly fashion

FIGURE 1

```
(TODATE)

G;13;;CAL/C;D1.1;F,;P;1,12;EADD(C2)=C2;#1M20,2=M20,2;ADD(R18,22,2)

=M22,2;ESC;P;15;GR;1;2;Y;*;;12,000,000;0;N;SB;NF;N;12,70,/4;DC;1;CA;D;15;3;-1

;-2;1;N;IC;Y;3;2;ESC;P;15;L;B;STOP
```

and as a summary of codes. I can, for example, thereby see how much insurance I have paid out in the last year, and the amount, date and cheque number of a specific payment in question. A summary page is produced, showing cash flows and spending within each code.

3. Bracing calculations to NZS 3604: Copious data from tables and variable options are all processed by the computer.

4. A budget estimate program for comercial and residential projects.

5. A detailed quantities schedule for residential buildings program with a library of items and costs stored on disk.

6. A landscape design program with detailed characteristics and environmental requirements of over 500 NZ plants stored on disk, processed by computer to locate those that satisfy the user's specifications.

7. A typing tutor program to train the operator to touch-type.

8. A year planner diary: I see my warrant of fitness is due next week.

PIPS III provides two ways to write an Automatic Program. The first is to carry out each step of the process on the screen and as you go, ask the computer to automatically record every step you take. In this manner, you do the job manually the first time, thereafter automatically. The second method is to write out the program line by line.

Shown in Figure 1 is an Automatic Program with side comments as to what each unit of data is doing. A sample data page it will process is shown as Figure 2, and the results in Figure 3. This program uses very few of the special instructions available to a PIPS user and is intended only to illustrate what a PIPS III Automatic Program looks like.

The task is to collate the 12 monthly income statements and produce a "Year to Date" statement for a directors' meeting in 30 minutes' time. As this has not been required before, you prepare a blank statement page which you file on page 13 of the disk. You then write the new Automatic Program which follows.

This program can be explained as follows:

<TODATE>
Program title

G;13
Get the blank Year to Date statement filed on page 13 of the disk.

CAL/C;D1.1;F,
Switch on calculation mode, show numeric answers to 0 decimal places, rounded up, and with commas between every 3 digits.

P;1,12
Designate pages 1 to 12, the pages which contain the data you wish to process.

EADD(C2)=C2
Add each row of column 2 across the 12 pages and put the answer in column 2 on the screen.

#1M20,2=M20,2
Go to page 1 and transcribe the year's starting balance on to the screen.

ADD[R18,21,2]=M22,2;ESC
On the screen page, calculate the closing balance

P;15
Put your new summary page onto page 15 of the disk.

As this took next to no time, you decide to also graph the results and append this to your table.

GR;1;2;Y;*;;12,000,000;0;N;SB;
Graph column 2 of the table using 12,000,000 as maximum data and 0 as the minimum.

NF;N;12,70,/4;DC;1
Aesthetically tidy up the graph to your presentation preference.

CA;D;15;3;–1;–2;1;N
Append the graph as a column 3 to your table.

IC;Y;3;2;ESC
Insert a narrow blank column between the data and the graph for clarity of reading.

P;15
File this amended summary page onto page 15 of your disk.

L;B
Print out the contents of the screen.

This complete program is written on three lines and can be executed at the push of one key. Or you can now include it in the overall administration program you have in operation.

At present PIPS III runs only on Sord Computer's extensive range of 8 and 16 bit computers. Mitsui Computer Systems is the NZ distributor, part of the worldwide Mitsui & Co Ltd which recorded total trading transactions of over $NZ129 billion for the fiscal 1985 year and is found in over 88 nations. Sord Japan has advised that PIPS IV-G will be released soon and a version to run on the IBM PC AT will be released later.

Some further queries may be briefly addressed:

Format of data produced: PIPS is a structured program which processes standardised ASCI II text files. These files can be read or written to by any user utility, not just DBASIC, and can therefore be interfaced with user applications and programmes.

Back up: The manuals in themselves are excellent training guides and there are one-day training courses available for those who so desire.

Programming complexity/flexibility: It took me a couple of days to perfect program no. 1. One PIPS user found that he produced with seven lines of programming in PIPS what had taken 163 lines of BASIC to produce. With PIPS you are stringing together ready-made programs to perform units of tasks. The hard work has already been done, and each of these programs allows you, through specification options, to achieve a wide range of flexibility in operation.

Other PIPS III programmers may wish to communicate and possibly meet for discussions. At present I am completing a desk-side companion which will tap the experience of many different users and plan to make it available to the PIPS III programmer. Any comments are welcome.

FIGURE 2

(INCOME STATEMENT-APRIL)	(19. 4.86) F25
SALES & OTHER INCOME	0
NET SALES	925,766
INTEREST FROM SECURITIES, DIVIDENDS	20,335
TOTAL SALES & OTHER INCOME	946,101
COSTS & EXPENSES	0
COST OF SALES	656,816
SELLING, GEN & ADMINISTRATIVE	162,019
RESEARCH & DEVELOPMENT	42,495
INTEREST	38,590
OTHER	6,667
TOTAL COSTS & EXPENSES	906,587
INCOME BEFORE TAX	39,514
INCOME TAX, CURRENT	20,152
NET INCOME	19,362
SUMMERY	0
BALANCE AT BEGINNING OF PERIOD	44,827
CASH DIVIDENDS	-4,683
BALANCE AT END OF PERIOD	59,506

FIGURE 3

(INCOME STATEMENT - YEAR TO DATE)	(19. 4.86) F25
	0 3,000,000 6,000,000 9,000,000 12,000,000
SALES & OTHER INCOME*	0
NET SALES	11,294,345
INTEREST FROM SECURITIES, DIVIDENDS	248,087
TOTAL SALES & OTHER INCOME	11,542,432
COSTS & EXPENSES*	0
COST OF SALES	8,013,155
SELLING, GEN & ADMINISTRATIVE	1,976,632
RESEARCH & DEVELOPMENT	518,440
INTEREST	470,799
OTHER	81,337
TOTAL COSTS & EXPENSES	11,060,360
INCOME BEFORE TAX	482,070
INCOME TAX, CURRENT	245,853
NET INCOME	236,216
SUMMERY*	0
BALANCE AT BEGINNING OF PERIOD	44,827
CASH DIVIDENDS	-57,133
BALANCE AT END OF PERIOD	949,883

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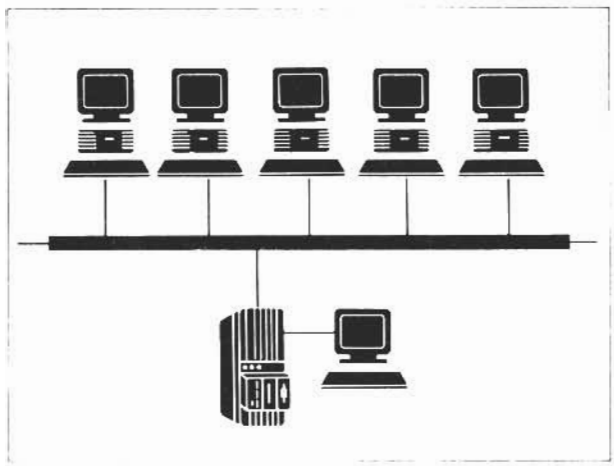
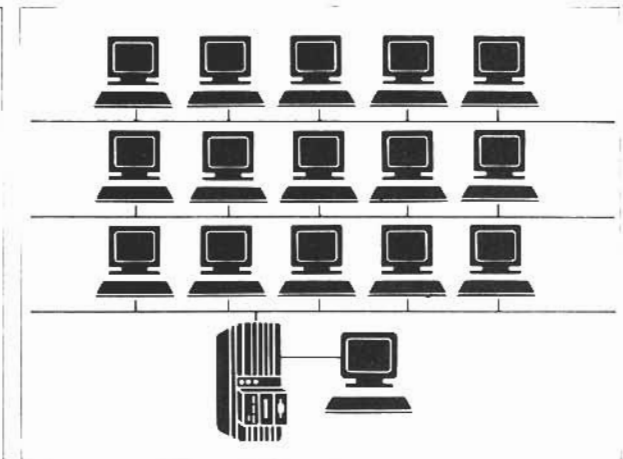


Operating in a LAN Environment



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4469

PC AT CREATING THE STANDARD

You don't need a crystal ball to recognise that the AT will rapidly become the PC standard with its increased processing speed, (Intel's 80286 chip) and vastly extended hard disk and floppy disk capacities.

Now that we have the AT we also have a box that runs Unix, or Xenix if you prefer. What we are all awaiting with bated breath is the conversion of all the popular productivity tools to run under Xenix with two operators using Lotus and a third into Dbase III. Naturally the AT will need at least 1Mb of memory.

With the availability of turbo-cards, hard disks on additional boards that slip into your expansion slots, it is possible to supercharge your old PC XT (8088 chip) into a processor that resembles an AT for performance.,

With the price of some ATs right now, in particular the Televideo CAT and the shortly to be released Wyse AT, we are seeing a dramatic increase in terms of processing power per dollar of investment. An AT for under $7,800, and it was only three years ago the IBM XT was nearly $15,000 and we have been running a 15 per cent inflation rate!

We suggest the 8088 compatible will be obsolete within nine months, at which time we should see a range of locally developed Unix-based software on the market to give the AT a greater thrust.

Charter – a sequel

Since our article last month we have had contact with Chevron Software (not Industries) who has acquired the Charter source code.

We do apologise for the inference in the opening paragraph last month that Chevron was not capable of providing the on-going promotion and support of the Charter series. David Harris, managing director of Chevron, advises me that he has been supporting more than 70 Charter sites for the past two and a half years and knows the product intimately. Chevron's intentions are to develop Charter along the lines that the users and the marketplace demand, which will involve building new features into an already feature-rich product. There is even talk of a multi-user version!

Chevron, we wish you well.

Unhappy users survey

MicroLab has thought for some time that we should address the marketplace to determine who the dissatisfied users are and assist them to get a better return on their investment.

We would estimate that almost 60 per cent of microcomputers in small to medium size businesses are not working to capacity. It may be the failing of the software, it may be the users' unwillingness to get to grips with the new technology, or it may be the constant change of staff in the users' offices. Whatever... there is scope on most sites to dramatically improve the performance of their computer.

With MicroLab's position in the market we would like to think we have a good working relationship with most suppliers, to the extent we can resolve any vendor-related problems on your site.

Systems 86

Whoever said there is a trend away from trade shows must have put a notch in his belt after this year's Systems Show. The droves that visited the showgrounds in the early 1980s really are now only a memory.

Although attendance was down, some of the hardware vendors were very positive and confident that they would turn enquiries into sales. We are told genuine buyers as a percentage of total visitors gets better by the year.

It is a substantial investment in both dollars and time exhibiting at the show, and we wonder if it's just a case of flying the flag or whether the marketing dollars could not be spent more wisely. From the businessperson's point of view the show is not the place to discuss one's business affairs in detail. It is generally cold and impersonal, not the atmosphere to be wooed into parting with thousands of dollars.

At the Systems Show it is a noticeable trend that there are fewer of the recognised computer hardware and software suppliers, and an influx of vendors on the periphery. There are simpler and more convenient ways to appraise a range of hardware and software. We are not offering any prizes for correctly guessing how!!

Wake up, all you programmers!!

They say the computer industry is progressive and innovative. Certainly we see plenty of exciting new hardware products on the pages of *Bits & Bytes* with new graphics capabilities and faster processors. But who uses them? Whose accounting system uses sound effectively – or colour? Who uses mice and drop down windows?

Let's face it – probably one half or more of the time we spend in front of our PCs is doing pretty routine stuff – running our business's accounting systems. Now with all the innovative minds in our industry, what do we get from the software houses? Boring plain vanilla programs whose main

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claim to fame is that they don't fall over! (much!)

We mentioned last month that in many ways Charter had set the standard for New Zealand accounting software. The trouble is – no one has bothered to improve on these standards since!

Sybiz challenged our traditional thinking with its function key operation and function/ledger rather than module/function approach. Sybiz Plus offers us a calculator and enquiry facilities on hand at any point in the program. Even Cashlink offers us a Wordstar-like word processor included in the suite of programs. But are these really innovations – or just clever marketing? And why haven't the other popular accounting packages met the challenge?

Some programmers say keep it simple – just give the user the bare minimum and make it quick to use. After all, who wants to spend longer on bookwork than he needs to?

We agree with the sentiment – but not with the approach. Running a business is a complex, highly inter-related operation. You often need to do some rather complicated things, sometimes at once, such as taking a customer phone enquiry while you're working out how well the new sales rep did last month, while your secretary hovers over your shoulder waiting for you to give her your notes for new price lists you were due to send out yesterday. Phew! The real world is like that. WE all chew gum and walk at the same time, so why don't software developers remove their blinkers and design products that actually work the way we do – not the way computers do?

The recently released DSIR study of the New Zealand software industry identified marketing skills as a weakness. A key aspect of marketing is understanding what the customer (the software user) wants. We're amazed how many software companies don't really know.

Okay – what sorts of things should, or could, software developers be giving us that would make life easier?

How about something easy to start – context sensitive help throughout. If CBA can do it, so can the rest of you – and it's far cheaper than printing a manual!!

How about an on-screen calculator available anytime? And a diary. We could always buy "Sidekick", but it would be nice to have all our management tools in one package.

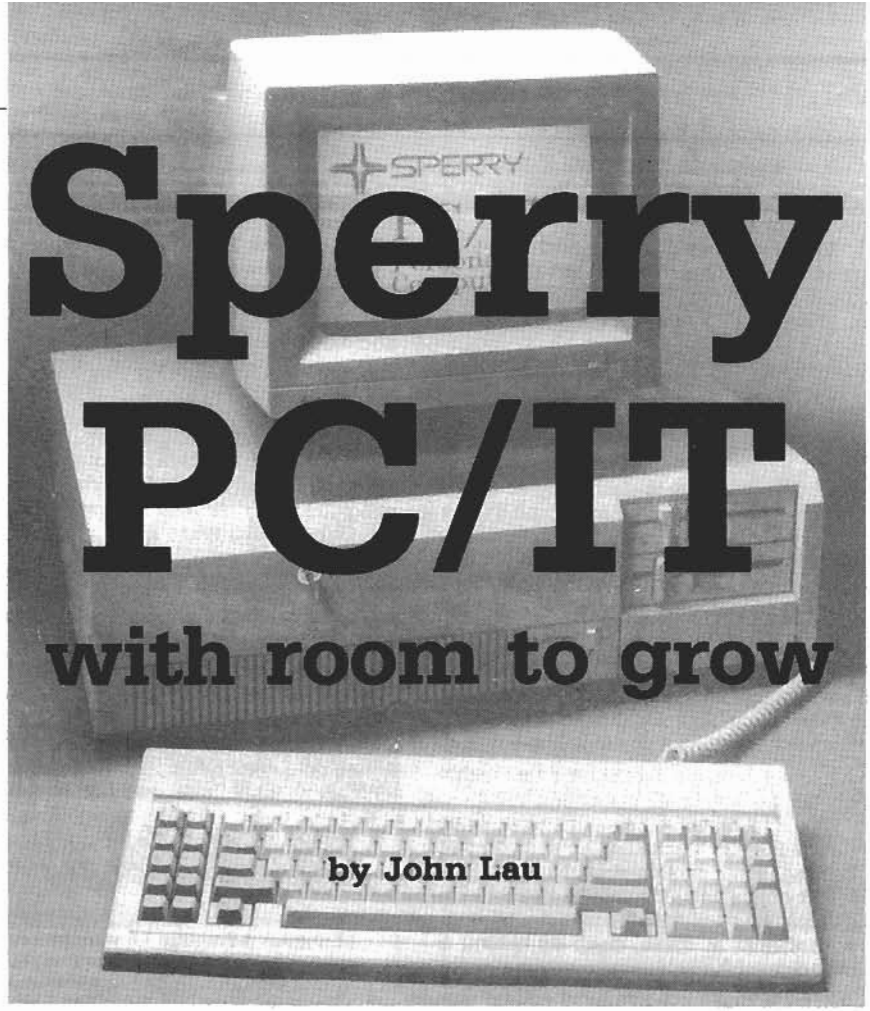
And how about split screens or windows? We want to be able to jump to any part of our system from anywhere else, without all this time consuming quitting and plodding through menus.

And so on we go – the possibilities are limited only by the imagination. Many of New Zealand's software developers have come from big systems backgrounds, or have trained in the structured environments of COBOL and the like. The systems they have grown up with were old, slow and cumbersome. But today's businesses are using PCs that can play music, display colour, and perform all sorts of tricks. The hardware's much more powerful, the scope for imaginative programming is much greater. So how about it guys!

In this regular column we keep the business person in touch with developments in the microcomputer industry.

The research reports are prepared by Jenny Peacocke, Grant Furley and Phil Ashton at KMG Microlab, an independent consultancy established by the accountants KMG Kendons in Auckland.

Sperry PC/IT with room to grow



by John Lau

The new Sperry personal computer is here, an IBM PC AT compatible with a lot of room to grow as you grow. The PC IT computer system comes in the now familiar three-unit set comprising the main computer itself, a color monitor and a keyboard. The reviewed system has a voice kontroller (yes, that's how it's spelled) interface.

The main unit comes in a giant box by PC standards, almost filling all the boot space in my family car. It is also very heavy, all 22 kg of it. The system unit is physically 17.4 cm high, 58 cm wide and 42.7 cm deep.

The reviewed system is an enhanced unit with 1 Mb of RAM (random access read/write memory), high resolution color monitor and a professional keyboard. Extras fitted include a 60 Mb tape backup unit and the voice kontroller interface at a cost of approximately $5000 and $3000 respectively. The price of the rest of the system is $18,616 including tax.

PC IT is based on the Intel 80286 microprocessor with a built-in clock. Processor speeds of 6, 7.16 or 8 MHz are dip switch selectable, but the switch is located inside the main system unit on the motherboard and it took me several minutes to change the speed.

Two asynchronous and one parallel interface come as standard along with a very clever 1.2 Mb 5¼ inch floppy diskette drive, a 44.6 Mb hard disk and controller, and eight expansion slots.

The floppy disk controller recognises the format of whatever preformatted floppy that's inserted into the drive. For example, a 360 Kb floppy formatted on an IBM PC compatible machine will be written onto by the PC IT using the same 360 Kb format. It will write in 1.2 Mb format if you use a 1.2 Mb floppy, and of course it formats blank floppies at 1.2 Mb.

So this is one truly compatible IBM PC/XT/AT compatible floppy drive, a very useful feature to consider if you have a whole lot of them around. No problems whatsoever will be encountered with data incompatibility, and while many other 80286 based computer systems have 1.2 Mb diskette drives, they can only read in 360 Kb format and not write. This is the first that I have come across that reads and writes in both formats.

Additional memory can be added to the PC IT. A maximum of 4 Mb using 2 expansion boards (and slots) will be required. A socket is provided for the 80287 numeric math coprocessor, giving improved performance for floating point, extended integer and BCD data type handling with transcendental operations. Basically it enhances computation bounded applications, for example large spreadsheets or scientific programs.

An additional diskette drive or a fixed disk could be installed into the main unit, only one additional in the review system with the other being taken up by the tape backup unit. Without it, the system would be able to support two floppy diskette and two hard disk drives. Thus a more logical choice would be the installation of hard disk 'D' because there is not much need for a second floppy drive. What about copying floppies? you might ask. That would be just as easily accomplished by first copying down to hard disk and then backing to another floppy. With two hard disks installed, you would have 90 Mb of storage. What a set-up that would be!

Other options include a floor stand with bottom cover to allow the placement of the system unit on the floor in a vertical orientation. The footprint of the main unit in a horizontal position is almost 1½ times that of an AT and twice that of an XT, so anybody with desk top space at a premium should check this option out more seriously.

Multi terminal adaptor takes up one slot and it allows connection of up to four asynch. devices for use in a multi-user system, for example in the optional UNIX system setup. (Sperry calls it XENIX). The adapter has four 9-pin connectors and all you need are the terminal cables and dumb terminals. Thus with the maximum of two multi terminal adapter installed, the PC IT would be able to support up to nine users simultaneously, all able to have access to centrally stored applications, data, programs, utilities and peripherals.

The high resolution 12 inch colour display unit has a 640 by 400 dot screen resolution and 192 Kb display buffer. It can display 256 colours when in 320 by 200 and 320 by 400 modes (medium resolution). In the high resolution 640 by 400 or 640 by 200 modes, 16 colours are available, when even the text and numbers appear sharp and clear enough to be intermixed with graphics. Thus long hours on the word processor in colour should be no problem.

One small irritating thing about this colour monitor (and a lot of others as well) is the 'ghosting' when test is scrolled or screens refreshed. This is more apparent in a slightly dimmed room, and in a brightly lit office environment, it is acceptable.

The reviewed monitor did not come with the proper power cord to connect it to the switched power outlet for the monitor on the main system unit. A separate plug connected the monitor to the wall outlet, with the need to power the monitor on and off manually. This is rather important in the interest of power economy and prolonging the life of the display unit, and I unknowingly left the monitor on one night after shutting down the main unit.

Sperry PC/IT

The keyboard

There is a choice of three different keyboards for the PC IT, namely the standard, advanced and professional. The professional keyboard of the review system has 100 keys including 10 function keys in 2 groups of five, horizontally spread across the top of the keyboard, separate cursor and numeric keypad, and a new pause and system reset keys.

The reset button on the main system unit is well hidden in a very tiny recess in the front and under the power on light, able to be activated with a blunt object such as a pen or pencil to poke into it. There is another button on the keyboard. Both CTRL RESET keys need to be hit to reset the system rather than just the RESET key alone. Good thinking Sperry. Of course, with other keyboards, you can do a reset with CTRL ALT DEL keys, and the PAUSE key likewise replaces a two-key command common on other keyboards. It is used to suspend a task, for example temporarily stop printing.

LED indicators are found onthe LOCK, NUM LOCK, CURSOR PAD keys.

Another nice touch is the inclusion of homing locators on the 'F', 'J' and '5' keys, with slightly raised '–' on the faces for quick indications of where your fingers are. This is a heavyweight class keyboard, checking in at 2.68 kg.

Overall I find the keyboard easy enough to use. The keys feel positive although they do not offer enough resistance to my liking.

Voice kontroller

If you have been waiting to communicate with your computer system using only your voice (just like in the movies), then Sperry has come up with this interface that will do the trick for you.

A combination of speaker and microphone with attachment cable is supplied with the PC IT voice kontroller card. Incidentally, this card also fits into your regular PC and compatibles. The unit is approximately 12 cm square and draws power from the PC itself. The microphone jack and speaker jack use the standard 1.27 cm phone plug and 0.317 cm mini plug respectively.

This interface provides you with a natural way to talk, literally speaking, with your computer system. It thus enables the users to speak in their own languages, however varied, in a natural conversational flow. The PC voice kontroller recognises previously trained words from a user's library of word templates. Up to 10 of 64 voice commands for each application can be programmed, and each voice command can replace up to 30 keyboard character sequence. Even when using the voice kontroller for input, the keyboard is completely active and can be used in conjunction, and another feature permits replay of the pre-recorded voice messages for operator prompting, feedback and messages. If you do not like listening to your voice, try programming with someone else's. Great fun!

Easy train software (KEYMAKER) is provided with the voice kontroller card, menu driven to provide a simple and quick way to help train the PC IT to recognise your voice commands. The procedure is to type your phrase (command) onto the template and then speak naturally into the microphone. Repeat the spoken phrase, and type in the key sequences that you want replaced by the phrase. For example, you can say, "Start Lotus 123," which replaces keystrokes "CD/123 RETURN, RETURN." Up to 30 keystrokes can be stored for a single voice command, a real joy in repetitive work.

I tried out my own voice-controlled command exercise with Lotus 123. I could do everything without the use of my hands. "Start 123," "Monthly Forecast," "continue," "Annual Sales," "Sort," "Give me a Status Report," "Who are the problem accounts," "Quit."

I encountered no problem with Lotus 123. In fact, Sperry claims that the voice kontroller could work with all MS DOS 2.11 and higher application programs, for example Symphony, Wordstar, etc.

As you can see, a considerable saving in keystrokes can be achieved. However, this is only worthwhile when you have repeated tasks. Likely users could be top-level management who could be suffering from keyboard-phobia or handicapped people where the use of hands or sight is limited. For remote operators, for example, the computer with voice kontroller could be located in head office and still be operated from other rooms, the factory floor or warehouses using, say, two-way radio or telephone.

Tests were carried out on the PC IT, IBM PC AT and COMPAQ II portable. On the Sperry PC IT, the CPU (Central Processor Unit) clock was set to 7.16 MHz with zero wait states for memory access. The IBM PC AT was running at 6 MHz and had a 80287 math coprocessor fitted. The COMPAQ was an AT compatible running at 8 MHz.

The spreadsheet was from Lotus Symphony with 30 columns by 100 rows. Most of the common arithmetic functions were used in the recalculation, including multiplication, addition, subtraction, division, summation, maximum, minimum, and variance. The 'load' and 'save' were to floppy disk (for tansportability) instead of hard disk.

In the BASIC math calculation program, the time taken was for an iteration of 5000 division, multiplication, addition and subtraction operations using BASIC interpreter. In the case of sieve, the time taken was for one iteration of the sieve of Eratosthenes' prime number benchmark program. The program is written in BASIC and generates 1899 primes.

The performance index is relative to IBM PC and derived from running one of Norton's utilities:

	PC/IT		PC/AT		COMPAQ	
	min	sec	min	sec	min	sec
Booting up		15		29		27
Tape backup (21 Mb)	9	40		—		—
BASIC Math		13		24		14
Sieve		41	1	05		45
Performance Index	8	3	5	7	7	7
Spreadsheet:						
Load		38		38		48
Save	1	13	1	15		49
Recalculate		15		15		14

Sperry PC/IT

Conclusion

I have not many complaints about the PC IT other than its size and weight, and there is no tilt and swivel base for the monitor. The asking price is high, but it has the performance to match.

Overall I found it a very impressive piece of machinery. It should be one of the major contenders in complex environments such as LAN (Local Area Network), host computer communications, or multi-user systems. It has lots of memory and a 44.5 Mb hard disk, while the tape backup is a very handy option. The inclusion of the voice kontroller would be a welcome option for a particular section of the market, but the most useful component for me is the intelligent diskette drive.

The PC IT is highly recommended.

Name	Sperry PC IT
Manufacturer	Sperry Corporation, USA
Components	
Processor	16 bit Intel 80286. 6, 7.16, 8 MHz switchable
Mass storage	1 1.2 Mb 5¼ inch floppy drive
	1 44.5 Mb hard disk drive
	1 60 Mb tape backup
Memory	1 Mb RAM on motherboard
Display	12 inch high resolution colour monitor
	16 colours, 640 by 400 pixels
Keyboard	QWERTY 100 keys including 10 function keys
Interfaces	2 asynchronous
	1 parallel
	1 Voice Kontroller
Software	MS DOS 3.1
	GW BASIC
Documentation	5 volumes
	MS DOS, BASIC, Voice Kontroller, Tape Backup and System Installation
Price	
Enhanced system unit	$14661
HR colour display	$3575
Enhanced keyboard	$482
Hard disk	$4365
Tape backup	$5047
Monochrome monitor	$1165
Floor stand	$240
Multi terminal adaptor	$882

Reviewed system supplied by Sperry Information Systems, Wellington.

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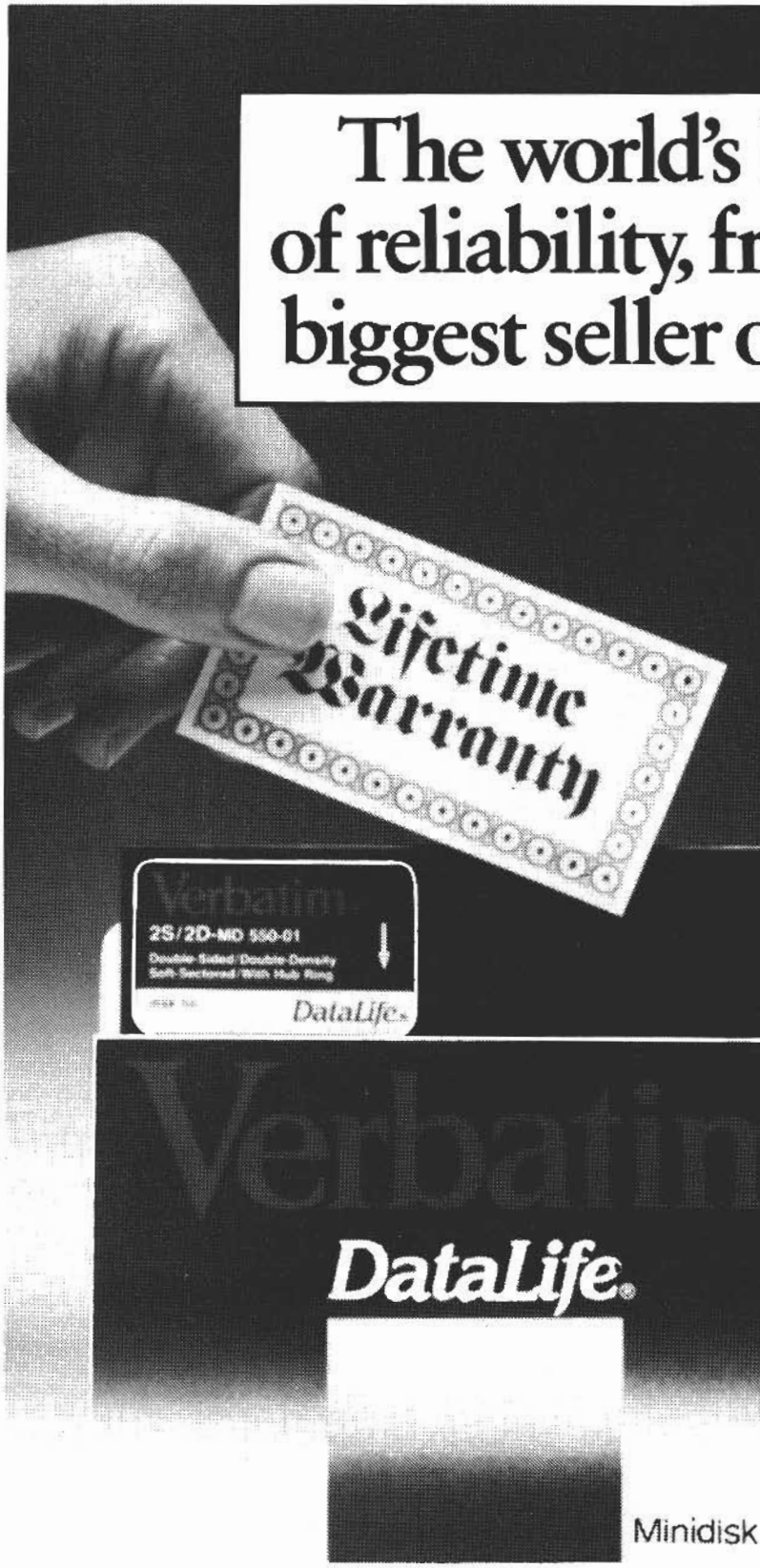

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PROFAX

Integrated accounting at its best

by Peter Biggs

"Yawn, yet another 'integrated accounting package'. The market is full of them!" I hear you say.

Too true. Accounting software has always been the bread and butter for programmers and has proliferated accordingly. After all, all businesses do it, whether they be the corner dairy or a multinational corporation.

Accounting itself is an arcane art with double entry bookkeeping being its major arcanum. To most businesspeople who cannot afford the luxury of a full-time accountant and bookkeeper, accounting is just an end-of-the-month headache. It never goes away and is always too historical to be of much benefit day-to-day.

As any businessperson knows, usually the hard way, money in the bank does not mean profitability, and the reverse is also true. Most businesses never know exactly what the financial status of the business is at any one time – they just fly by the 'seat of their pants'. They simply do not have the time to number-crunch every day nor do they want to be bookkeepers.

With GST on the horizon, I decided that the time had come to enter this world of true accountancy using the processing might of the computer. I chose an IBM compatible computer and then I looked at all the available small business accountancy software I could find.

Before I go further, I should explain something about my peculiar attitude to computer software. I like the installation to be convenient and easy, the screens to be attractive and laid out for maximum ease of use, the commands to be simple and not memorised, and the software to do as much as possible. I also like software to be open, in that data, once in, can be extracted from it to other software.

Finally, to commit my business to a software program I need reliability and aptness to the NZ situation. NZ-written software for accounting is my preference.

I also do not like software that relies on a single system disk for copy protection because if it becomes damaged, the software is useless while the disk is being replaced, often from overseas.

So I came across Profax. First I liked the fact that I could play with three demonstration discs before I commited myself. This enabled me to be sure that it was right for me and my particular business.

Convenient

It seemed to score highly in all respects. I immediately liked the obvious care taken with its screen presentation and ease of use. It seemed designed to be convenient!

So that's why I bought Profax for my business and hence am writing this review.

Now to Profax itself.

It comes with a 200-page manual, attractively bound in a slip case. The manual is professionally presented and laid out with clear headings and references. The program itself comes on three 5.25 inch discs – a starter, program and data disk. It seems to run on most IBM compatible computers.

Profax can be used with dual floppy disk drives but, with the cost of hard discs being very reasonable, I use it on a hard disk.

The program is 'protected' in this way. On purchasing Profax you then send in the company name on an application form printed by the program to Logical Methods in Auckland. A system number is sent back to you. This number is then typed into the program as the system initialisation and the program then becomes 'live'. This company name then appears at the top of every report, etc. If you wish to change this at any time, contact either your dealer or Logical Methods.

Next are the data files. These can be resized to your own requirements at any time, providing you have the disk space. The single data disk will hold about 500 monthly debtor transactions, 100 monthly creditor transactions and carry 500 stock items. Reading from and writing to a floppy disk is always aggravatingly slow compared to a hard disk, but if you have patience, it is quite usable in this way. A hard disk can obviously hold a lot more.

Installing to a hard disk is easy. I made a directory called PROFAX and copied all the files from both discs into it. Then a file called PFINS will install colour (if you have a colour monitor), and the data and program files now both need to be changed to the hard drive (drive C on my computer). If I wished, I could keep the data on one directory and the program files on another.

Starting up

Typing PF starts the program. A title screen flashes up and then the master menu appears.

From here you can go to accounts receivable, inventory control, invoicing/sales analysis, accounts payable, general ledger and GST. The G/L can be protected with a password to prevent unauthorised access.

Data file exporting is a little tricky, but financial information can be pulled out into Lotus 1-2-3, Open Access, Visicalc, Supercalc III, dBase III and Wordstar – in fact, any other program capable of using DIF format files. I found this useful for cash flow forecasting using a Lotus 1-2-3 spreadsheet.

Also on the master menu are the options for file recovery. This is used if a power failure occurs while processing, not an uncommon event in some industrial areas, and files are left open. Many programs have difficulty with this. Profax has software that determines if corruption has occurred and works through each file that has been left open and check the validity of the data. It works through each record in the masterfile and checks that all transactions are correctly associated with the correct accounts, etc. All irrecoverable transactions are reported, and it also may restructure

some files at the same time. Obviously weekly backups are important as well.

The system initialisation enters company details, the security code number (which unlocks the program), G/L password and sets the audit trail options.

Resizing the data files on basis of transactions, creditors, debtors, etc. can be done at any time. You are warned if the data files are not large enough to complete a transaction. Floppy disk users will need to watch these sizes.

Now to using the program. The accounts receivable is for debtors. It offers a full customer enquiry and editing facility. Transactions and statements can be sent with a statement message and printing of address labels. It also offers reports such as customer lists, debtors overdue, inactive, aged and nil sales.

Inventory covers stock handling. From here you can set up your stock lists by group and supplier. Full reports are available on backorders, stock by product code or supplier, and price lists, sales reports, stock valuation and stocktaking forms can be printed out.

The invoicing section is designed to be used with special Profax invoice forms #605, designed and printed by Moore Paragon. Form #201 is used for printing statements.

To enter up an invoice the customer must be in the customer file or else a 'cash sale' issued. The stock code is entered along with the number of items and all calculations (including discount) is calculated. A discount schedule can be set up for different customers and some inventory functions are here as well. One unique feature is its ability to add and edit comment lines. Freight and GST are added.

With accounts payable the accounts can be paid or part paid, payments can be split between different general ledger areas, and cheques can be computer-written if required.

General ledger (or G/L).

It is vital that the G/L is carefully set up at the beginning. Once set up, the G/L gives a business person the facility to have a set of accounts each month. Profitability and margins are all here in different reports as well as setting budgets. Many different reports are available.

The GST option allows you to set up the reporting system, the GST registration number and even includes an option in case Mr Douglas decides in the future to have multiple GST rates. Everything I need for GST is there.

What did I especially like about Profax? The screens are well designed for ease of use and the program has a very consistent key use. The ESCape enables you to escape out of what you are doing, 0 ends a menu and E exits from a transactions menu. Audit trails can be set as optional and even a printer is often not needed. The reports are many, varied and all are useful and include a full GST report. Obviously a trial balance and a profit and loss statement are available. The only other thing I would like is context-sensitive help screens but this would be impractical on a floppy disk system.

I found Profax about as complex as I would expect a good accounting package to be. Setting it up was both time-consuming and instructive, but it has definitely been worthwhile. Any accounting package would require the same. I'm still finding out other useful things it will do almost every day. I could use Profax to run a substantial business as long as it had only one profit centre.

In hindsight, probably the most daunting aspect of getting into computerised accounting was setting the system up. Consulting with my accountant was useful, then the input of all our creditors, debtors and stock, including working out a useful coding system for us, took time. You can get someone to set it up for you at around $400 and training courses are available from Auckland Business Academy.

Once set up, we ran the manual system beside this system for at least one month to iron out any problems. It has performed faultlessly and has vastly improved my financial control of the business. I feel very confident about October 1!

To close, I would advise anyone to see as many as possible accounting programs before choosing one. After all, it is your business you are playing with. Ask for demo disks to play with in your own time. At $1500 Profax isn't the cheapest or most expensive but it certainly stands out in the ranks as a superb implementation of an integrated accounting package. I found the price quite acceptable considering the savings in accountant's fees and the feeling of at last having a real-time financial 'grip' on my business. ☐

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Televideo's AT for less than $8,000

The American microcomputer vendor Televideo is introducing its AT compatible TeleCAT-286 to the New Zealand market at a competitive price. With a standard 512 Kb RAM, the 20 Mb drive version will retail here for $7,795, while the 30 Mb version will be sold for $8,895.

According to the NZ distributor, Calibre Systems Ltd, the AT was originally designed as a multi-user/file server with a large footprint to accommodate expansion boards. However, with the AT becoming the desktop PC of choice, says Calibre, the demand is for a smaller unit without sacrificing power or performance.

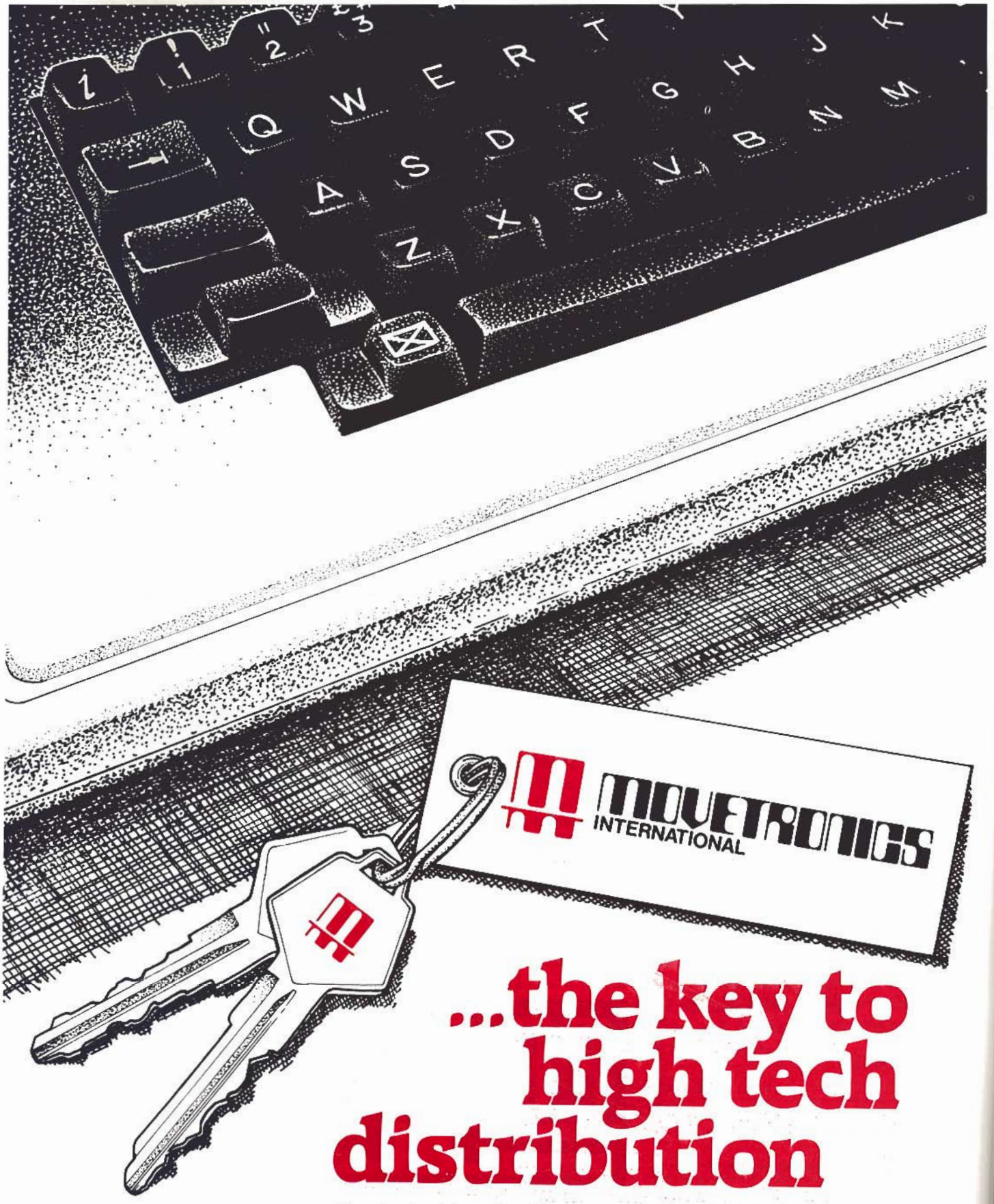
The TeleCAT 286's footprint is 400mm by 420mm, 28 per cent smaller than the IBM PC/AT. Its 512 Kb is expandable to 15 Mb, and it comes with a 1.2 Mb diskette drive, either the formatted 20 Mb or 30 Mb Winchester drive, keyboard, RS-232C serial port, parallel printer port, clock/calendar with battery backup, and five I/O expansion slots.

It is sold with MS-DOS 3.1 and GW-BASIC 3.1, and will be serviced throughout New Zealand by the Calibre Group. BITS & BYTES will carry a full review of the 286 in the near future.

New Flat-screen technology for Zenith Z-181

With the introduction of its Z-181, Zenith Data Systems reports "a superior combination of readability and portability" with a full 12-inch screen using the latest LCD technology and electroluminescent backlighting.

The display contrast ratio, or the colour intensity difference between the display character and its background, is as high as 12 to 1 on the Z-181, said to rival the resolution and legibility of the heavier CRTs supplied with desktop video monitors. In addition, the standard size of 12-inch display overcomes the flattening effect of the usual lap-top's 9-inch screen, restoring the true aspect ratio.



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How secure is your computer?

by John King

Somebody dropped a brick on the editorial desk the other day. Two bricks, actually, damp and distinctly grubby.

In the view of some person out there, those bricks are a fair swap for New Zealand's sole example of the Ampere WS-1 lap-top portable, sent to *Bits & Bytes* by Tom Tothill of Thomas Webb, Christchurch, for review. According to the brochure, sent by other means, the WS-1 is "Versatile, Powerful, and Portable", offering expansion up to 512 Kb RAM and such capabilities as teleconferencing or running as a multi-user system with its built-in autodial speaker phone and 300 baud modem, as well as all the usual functions of a new lap-top micro.

With a particularly neat aerofoil-shaped case measuring 33 by 28 by 9cm and weight of 4 kg, it has a fold-up 25 by 80 character LCD screen, or 480 by 200 graphics. All this would have been very nice to evaluate, but unfortunately somebody in the transport system thought his or her need for such a machine was greater than either the magazine's or the owner's, and substituted a pair of very second-hand bricks.

Quite apart from the morals of outright theft of property, it brings up the question of computer security. Not the sort concerning the access of data from a system, but the access of boxes from the transport system, and tip-toeing away with a computer under the arm. What's the situation out there, and is it possible to transport expensive but eminently portable goods around the country with any degree of confidence?

Mr Tothill personally delivered the 12.3kg carton containing his WS-1 to the railways shed on July 10. Four days later Southdown Freight Terminal, south Auckland, sent *Bits & Bytes* a card requesting a street address for consignment, and a week after that the carton was delivered to the editorial offices. It contained the two bricks and weighed 11.5kg.

That week's delay might well be crucial to the matter, as it would have been delivered from Southdown the same day it arrived there if the editorial street address had been indicated originally. "This is the first time I've heard of anyone going to the extreme trouble of repacking the box and re-sealing it," states Don Marshall, Southdown's freight terminal manager, "and I've been with the railways for 36 years, several of those in claims department. The waybill is kept separate from the goods, so there's no easy identification, and the time and opportunities just don't present themselves here."

Also puzzled is Tom Tothill, who now owns two damp second-hand bricks. "I've consigned computers by rail before, with no problems at all," he says. "It's just a matter of filling out the docket, and it's the cheapest way of getting it there. I've also never had anything damaged by the railways."

Nevertheless, some police stations in major centres have special squads set up to investigate complaints of pillage. Constable Dave Thurlow, who handles the Wellington end, says most cases he handles come from the railways and Cook Strait ferries. "We don't get much about computers," he adds. "The main bulk of those goes by other means, but the odd one does go missing. We recovered one in Palmerston North a few months ago, and you'd be quite surprised how much we pick up if we have the serial number.

"But if you have something like that hanging around in a parcels office, there's a helluva lot of people passing through."

Railways' lack of security comes in for criticism from other carriers, who admittedly have a vested interest in promoting their own services. Chris Hill, national marketing manager for TNT Overnite, says his company is the only one to have an automated freight conveyor line, with little pilferage problem. The associated Alltrans, which moves much of its heavier freight by rail, has "far more trouble", and Chris gives the example of one well-known manufacturer which has a casualty rate, both pillage and damage, of some 40 per cent.

TNT's Next Day service sends all North Island goods by road from Auckland, while those to South Island destinations are flown. For the Deadline service everything is sent by road, loaded into sealed rigs which are left untouched until they reach the other end, including the Cook Strait crossing.

"The faster it goes, the better the security," Chris points out. "With our system there's no shunting, no standing in open wagons for days in the rain in railyards. The greatest pilferage is where a load sits overnight, and at times we'd have $5½-6 million worth of stock sitting on the dock."

Computer Transport Services sends all its goods by road, by locked trucks – 52 of them – each with two people aboard and equipped with hydraulic tailgate in line with the company's emphasis on security and handling. "We specialise in the high-tech industry," says general manager Craig Magee. "Ninety-five per cent of our goods would be professional products, the majority of those being computers or photocopiers. We run only our own vehicles, with no subcontracting, for reasons of security and damage."

He reluctantly admits to just one case of pillage, "fairly selective – a PC", but says the country's major problem in that line is Cook Strait and the coastal roll-on ship. CTS and its subsidiary Fliway have rail exemptions with the support of the Railways Corporation, with transport costs "substantially more than railways, but cheaper than air".

"High-tech equipment must go to the professionals," states Glen Spargo of Movetronics International, the specialist part of Movements International with its head office in Christchurch. Again using its own vehicles, the company carries a large quantity of hospital equipment and computers, with "no problems whatsoever", according to Glen.

Other companies agree it's generally accepted that the higher cost of the specialist carriers lends a certain air of authority when transporting expensive equipment, although as TNT's Chris Hill points out, "With the change from mainframes to smaller machines there's not the need for specialised computer transport."

Andair's Jerry Chase says his company uses a number of sources, including Air New Zealand, and although there's the occasional damage, nothing has gone missing for at least a couple of years. Noeline Williams of the associated firm of RED Express admits to having had a couple of problems with things going missing, but no cases of substitution. "We send things by Air New Zealand when crossing Cook Strait," she says. "We have no contact with the ferries, mainly because of the strikes."

The moral of the story seems to be that you get what you pay for, and cheap transport is not necessarily the safest for easily portable consumer goods, which describes the typical lap-top microcomputer.

Ironically, *Bits & Bytes* is unlikely ever to try the Ampere WS-1 which was the cause of all this. "With the yen having moved against us 20-30 per cent," says Tom Tothill, "it's been priced right out of the ballpark. It retailed around $5,800 before that, and adding the yen movement makes it too expensive compared with other lap-tops." □

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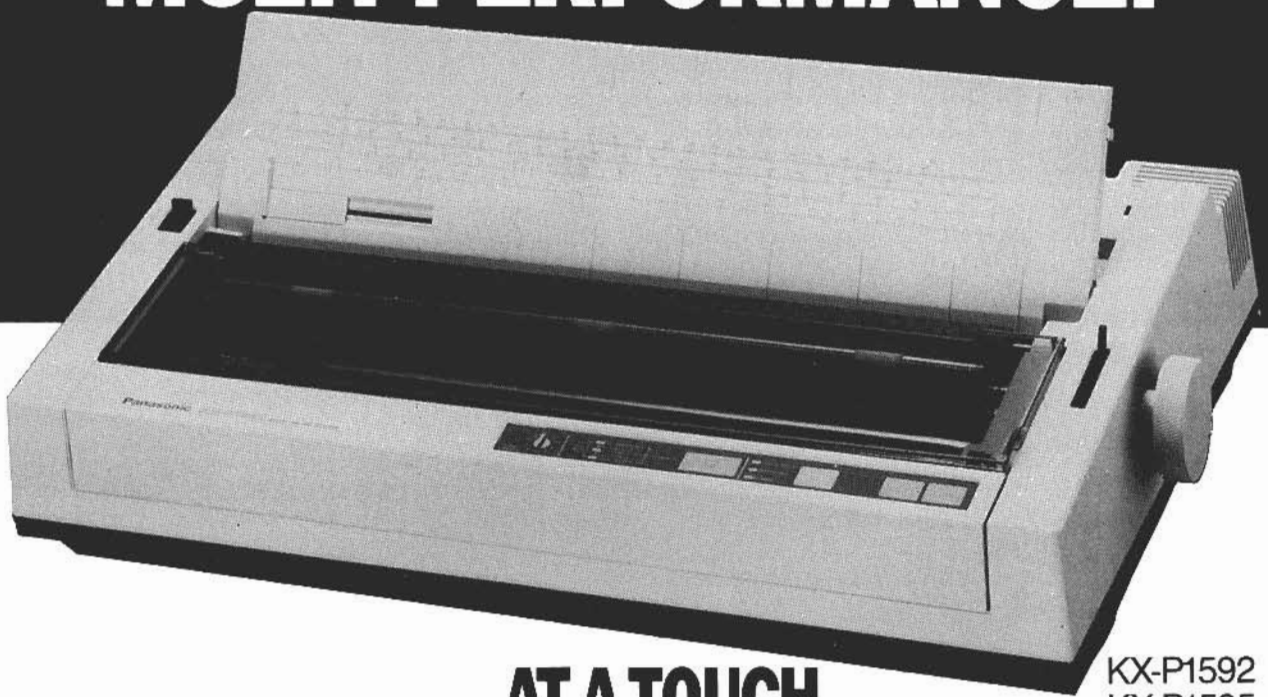

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Domesday: Geography (and much else) will never be quite the same

by Pip Forer

What happens when the common 20 Mb PC storage ceiling suddenly becomes 1000 Mb, when at the same time figures and graphs can be augmented by visual images accessed by computer, and when on one side of a single, two-sided 12-inch disk you could store one photograph for every day since the Treaty of Waitangi was signed, still have room to spare and be able to recall any single picture in under a second? And when it is all at a relatively low cost on an almost indestructible medium? Read on to find out.

Photograph John King

Motunau, North Canterbury

Go to a party and introduce yourself as a geographer: odds on some wag will ask you to name the capital of Albania, or the largest lake in Ruanda (if you don't believe me just try it). The image of geography as a learning of lists of capes and bays dies hard, and persists even among some of the better read in society. Modern geography in fact deals with far more important issues about land, people, policy and society. However, it is also true that all of this demands the geographer to work with considerable amounts of information, both historical and contemporary. This explains geographers' early and continuing involvement in using the computer for analysis and mapping. It also explains their heavy involvement in what may be the most significant breakthrough in statistical publishing this century – the Domesday project. This project is a quite amazing data base built around two components, the familiar microcomputer and the novel optical disk.

The Domesday the project's name refers to was an exhaustive survey of Britain by the Normans in 1086. The Domesday Project itself is a BBC co-ordinated exercise to create a definitive reference work on British society, 900 years on from the original. Some publicity has been given to its early stages of develoment, but what really merits attention is that the project itself is only a shadow of what is to come. It heralds a breakthrough in how information about places is held. The old atlas will never be the same, nor will many of the ideas we have about what is legitimate computer data.

Geographers have a particular interest in this development because they, perhaps more than many others, use data on the environment. For some time, using the computer has been a natural tool in their repertoire. It achieved enhanced prominence in the 1970s when computer graphics became available to handle maps, charts and diagrams of terrain, and the remote sensing of satellite imagery is perhaps the best known example of this. Such systems can recall and map information, or produce tables, but costs for them were, and still are, high. The entry for a relatively small system (hardware and software) is perhaps $100,000. The better systems can easily reach five or ten times this cost when special graphics screens and plotters are included.

Such systems work with information that has been reduced to numeric form and, with great effort, recalled into the formal patterns of a map. Even the contours or river courses drawn back to the screen come from traditionally numeric information, X and Y coordinates. The computer then creates a map from the various lines and points. Often this is slow, and the results are usually relatively simple compared with a real-life scene or the most colourful or intricate printed maps. The great benefit of course is that the image can be very flexibly redefined to show just what you want it to (what area, what scale, or what information).

Sadly, because of the cost of the equipment and the specialist nature of the data, little of this information has ever become widely used outside large organisations. A few maps of some aspects of it have been published as computer atlases or in collections of computer imagery. And of course, none of these systems can re-

call the information of a living landscape in visual form.

Mixing maps and images

Domesday, or rather the technology it embodies, will radically alter perspectives on maps and other imagery in computing. It is a development that will install a new component into the sorts of data that everyday computers handle. That component is visual imagery, either static, animated or with sound. Domesday uses optical disks, the same technology as interactive video (IV), but uses it in a very different way from that in the training applications of interactive video.

It uses it as direct information in combination with traditional numeric and graphic computing. This combination is going to revolutionise how geographic and other information is made available. Systems based on it will end up being extremely widespread and using an extremely wide range of data. Domesday is only one special example of what is possible with this combination. It is special because by the time you read this it will probably be publically available.

So what is Domesday? The first Domesday systems will physically comprise a BBC microcomputer, a SCART monitor (a colour monitor that will accept both video and RGB signals), a special Philips Laservision optical disk player and two LP-sized optical disks. The cost in the UK will be about £3,500 for the entire system.

On the disks will be a mass of information that comprises a factual goldmine. There will be literally thousands of maps and aerial photographs covering the entire United Kingdom at several levels of detail, tens of thousands of slide images and hundreds of megabytes of information on British life, from what the average Briton is doing at any time of day to population statistics for London (or any area of the country) by each square kilometre. The data sets on the disk embody government statistics, special surveys, published maps and the results of a national 'peoples survey' where community bodies and interested individuals adopted areas of Britain and provided information on it. These areas were small (three by four km each), and each group provided answers to 69 questions about the area, plus some pages of description and at least four photographs.

Overall, the package ranges from a statistician's delight to an anthropologist's treasure trove (does the real life Audrey fforbes-Hamilton devote all her space to the manor when reporting her rural three by four km?). And it all fits on two 12-inch platters.

So far what you potentially have is the equivalent of several metres of library space on a couple of disks. What mobilises the information for effective use, and makes Domesday such a watershed, is the combined capabilities of the optical disk player and the microcomputer software. The disk can be used to deliver any information from a particular side of the disk within a second. That is near-immediate recall from 50,000 slides and 400 Megabytes of information (or sound, or animated video, or maps, or remotely sensed images) per side of disk. The micro controls this. The key element is the Philips video player which is currently unique in

that it can hold both visual and digital material (numeric and textual computer information) on the same disk. This player is a hybrid combination of a video disk and a CD-ROM, and is the major cost component of the whole package, while the disks themselves, with a reputed $50,000 worth of maps on them for a start, may sell for only about $500.

MIMPs, not WIMPs

The disks can also store software that is designed to make the selection of material from such a giant data base both simple and quick. Here geographers have been prominent in designing and implementing a MIMPs interface rather than a WIMPs one (Maps overshadow, though not displace, the Windows). Within this interface you can call up a national map and use a mouse or trackerball to point at a region. You then immediately get a more detailed map of that region, from which you can dive down to lower levels still if you wish. At any level you can 'map-walk', i.e. point to the top of the map and you 'walk' onto the next adjoining sheet.

You can point at towns and features with the mouse and get street plans, views from local beauty spots, and commentary. You can move the mouse along a road between two towns and get the distance between the two places displayed for you. You can also use the statistical information from the disk to overlay grid-square maps of population, land use, unemployment or one of many possibile variables on top of the normal maps.

This map-driven interface is supplemented by a 'tell-me-about' option that lets the user request information on a town, aspect of life or picture, using a more traditional typed input, and this too has a variety of options for data display. In one, which lets you investigate housing conditions, you can 'walk' around the inside of several typical housing types in the UK, while in another you can take a walk along a Dorset beach, looking at the flotsam and jetsam as you go if you wish.

Taken piece by piece, the individual components of Domesday are not particularly exceptional apart perhaps from the capacity of the optical disks. What results from their combination, however, is quite simply a revolution in what information is accessible, how much is accessible, where it is accessible, and the ease with which it can be accessed. It equates to the storage capacity of many small mainframes' disk pack, on a desktop, augmented by colour imagery and at half the price of a family wagon. Given the likely collapse in prices over the next few years the possibilities for rural education, library resources or tourist information are considerable.

Geographers, with considerable interest in measuring, analysing, monitoring, interpreting and displaying large amounts of data on aspects of the environment, are naturally among the most actively interested. They are also often among those with the expertise in handling spatial data bases, but this kind of system clearly has impacts in all areas of education, home and business.

Discussing Domesday with BBC staff reveals there are still clearly a few problems with the system as it stands. One major difficulty is that

(Continued on page 66)

RURAL COMPUTING

A blend of traditional and modern technology

Is there a place in agriculture and horticulture for computers?

Prime Minister David Lange has been quoted as saying, "A competent farmer isn't just one who can put in a line of fence, milk a cow, judge a sheep – it's someone who can manage his finances, judge a market, anticipate a trend."

While it's generally acknowledged these days that it's difficult to manage even one finance with a couple of dogs, the modern-day personal computer is a highly-efficient business tool which can be adapted for use on the farm.

In this introductory part of our series on computers in the rural sector, we look at the basic need for this new farming tool and how it might affect the economics of the primary industries.

Photograph John King Toshiba T1100 courtesy of Southmark Computers Ltd.

Rural Computing – overview

by Koos Baars

The farming industry is facing many new challenges and threats. Farming is becoming a business. Coping with economic instability and a more complex management structure requires the use of enhanced individual farm information to help vital decision-making in financial, animal and pasture management.

If the efficient management of a farm requires a lot of record keeping, data collection and analysis, a computer can be a useful aid. Personal computers are also very helpful in the assessment of management alternatives available to the farmer. A computer is just another farm management tool like a tractor.

But farmers have been reluctant to accept new technology. Can you trust details within programs? Consequently there has been a slow acceptance of computer use in the farming community, but there are also other reasons why acceptance has been slower than anticipated by many computer retailers, companies and software firms.

The basic question for many farmers is how do the added costs in terms of money, time and frustration compare with financial gain, peace of mind and increased confidence in decision-making? Farmers wish to have facts and figures. Regrettably few case studies have been published where the potential benefits and increased efficiency are obvious in larger profits.

However, surveys by the Kellogg Farm Management Unit indicate that the majority of existing users believe the benefits outweigh the costs. Early users give improved management and better access to information as the main reasons for buying a computer.

Quality and quantity of computer related assistance currently available is unsatisfactory, with very little training and education directed at agricultural applications being available. In Western Australia the Farm Management Societies run day courses, a place where a farmer could also get information on an objective comparative evaluation of packages.

With computers there is a substantial learning curve for users, many of whom are often living in remote areas with little help and assistance available. This applies to both hardware and software. Education has lagged behind the rapid technological development over the last six years, the education process having not only been neglected by those who should provide it, but also ignored by those who need it! Surprisingly, innovative farmers are often ahead of advisers and consultants in the use of computers.

Lack of software evaluation

Many farmers comment that it is difficult to get independent assessments of software. A lot is available, and many organisations and persons expect to make a profit out of the farming community. This has resulted in very little co-operation and co-ordination, with few of the available software packages having been compared and analysed in great detail.

Many computer dealers do not have access to a large number of programs. Basically the market is too small and suppliers of agricultural software are scattered around the country. Farmers want independent advice on price, performance and a comparative evaluation of agricultural software. It is not clear if an independent body for software testing would be helpful, and there might be more future in agricultural application groups set up by farmers in a district or run by a local computer dealer.

Notwithstanding the evaluation problem, there are a number of high-quality packages available on the New Zealand market, all developed by local companies.

Farmers have often been told to wait with buying microcomputers until databases on central computers come on stream, then they will be told what to buy. However, very long waiting periods have occurred and are being repeated again and again, creating a lot of false and real expectations in farmers' minds. This is an ideal situation for confusion, lack of co-operation and mistrust.

Do farmers have to wait? Self-contained systems are more suitable for farmers, telephone lines could cause problems. However, the advantage of large computers is that comparisons across the nation and district can be easily made.

Main uses

Based on a number of surveys, the main uses of microcomputers on farms in priority order are:

- Financial management systems, accounting.
- Database packages, mainly for animal recording.
- Spreadsheets, many uses e.g. financial modelling.
- Special applications e.g. feed budgeting and pasture growth prediction.
- Word processing.
- Access to databases on central computers e.g VIDEOTEXT and in future SHEEPPLAN, BEEFPLAN, Ministry of Agriculture and Fisheries chemicals, AGLINK index, NZ Dairy Board database.
- Computer links to machinery.

This priority order of usage also depends on the size and the type of farming operation. For example, at a recent conference in Armidale, Australian experts placed farm financial recording at the bottom of the list. They believed micros should be used for electronic trading, access to market reports, and other off-farm information, in that order.

There are limitations and problems in on-farm computer use, but the benefits outweigh the disadvantages. **If ever there was a need for farmers to know preicisely what is happening on the farms it is now.**

Computers are cheaper than they have ever been. The modern farmer should consider buying a computer to carry out many routine tasks and to assist him with more effective management of his farm.

MICROS FOR THE FARM
TODAY or TOMORROW
The Farmer who waits...

by John Bircham

In a companion article, Koos Baars gives us some insight into likely future uses of the microcomputer on the farm, but what about today? Confidence in the rural sector has reached an all-time low. For some, disaster has already struck, with many others on the brink of financial ruin.

GST is nearly with us, and the farm business needs help today, not tomorrow. With the cost of a computer system, both the machinery (hardware) and programs to run it (software), being roughly equivalent to a farm's annual fertiliser bill, it represents a major long-term investment which most farmers probably feel they cannot afford just now. In the minds of many are the questions:

Is there a place for the microcomputer on the farm today? Can it significantly improve the performance and profitability of the farm business today? Indeed, can microcomputer technology help at all, and if so, what can it do today to help make the farm business more profitable?

Let's think of the farm business in the same way that we think about the urban business.

Typically, the urban business uses the microcomputer to maintain debtors, creditors, ledgers, payrolls, stock inventories etc. The average farmer has no need of these tools. His or her accounting needs are usually met by the accountant. Some keep cash books manually but very few sort their entries into account codes etc. for preparation of end-of-year accounts.

Keeping a cash book on a microcomputer has positive advantages. Of itself it cannot improve profitability, but savings in costs through better financial management (eg reduced overdraft charges, greater awareness of costs) almost automatically occur because current financial situations are known today rather than in three months' time.

The farm business is no different from any other business in that financial planning is essential to success. The spreadsheet is the ideal tool for this task. The all important cash flow forecast demanded by all lending institutions as a prerequisite for lending is so easily and reliably calculated using microcomputer technology. Farmers are among the worst correspondents that I know. Letters are rarely answered, and a telephone call usually suffices instead. Why this reluctance to write letters when clearly written correspondence is so essential to profitable business?

The simplest of word processing packages on the microcomputer offers the ideal solution to the farmer. Typing skills, while useful, are not essential to word processing because mistakes are so easily corrected. The excuse that handwritten letters take so long to write and there is the hassle of the carbon copy no longer holds water. I know of one farmer who saved over $1000.00 on his fertiliser bill by putting his fertiliser requirements out to tender. He typed one letter and then changed the address of the company at the top.

The farm business involves the harnessing of nature. The timeliness of rainfall, wind, frost, sunshine or storm can all separately or in combination make the difference between profit and loss. If the weather could be accurately predicted, farming would be a breeze.

The manufacturer's production process is controlled in comparison. On the farm the vagaries of nature complicate the production process, with the majority of farmers allowing for these vagaries by conservatism in all areas of decision-making. Current government economic policy and low world prices for agricultural produce mean that any fat in the farm production process must be turned into dollars. To achieve this, production management must become more efficient

and financial management improve.

Until recently, microcomputer technology could only help farm management through analysis of historical records. Microcomputer stock recording packages gave the farmer the opportunity to analyse the performance of individual animals, provided that the time had been taken to collect the necessary records. There can be little doubt that such record-keeping is most likely to occur in the pedigree stock sector of the industry where there is financial incentive for such information. Few commercial farmers, with perhaps the exception of some deer or goat farmers, have the time or indeed the requirement to record individual stock performance.

The analysis of individual paddock performance is a must for any serious farmer, and again microcomputer technology is of assistance. Records of crop yield, grazing days, fertiliser history, metabolic disorders and other factors are vital to the objective analysis of the farm factory. Maintenance (fertiliser and regrassing) should be carried out on the most productive parts of the farm first.

For the horticulturist, microcomputer technology enables precise monitoring and control of glasshouse environments and irrigation, tasks which previously consumed precious time. Now that time can be used on other, more productive tasks.

However, perhaps one of the most significant advances in farm management that microcomputer technology has facilitated is the ability to do "what if" analyses that are meaningful. "What if" analyses by their very nature look forward into the future, and in farming that means trying to outguess the weather.

Koos Baars discusses two microcomputer models that predict pasture growth, GRASS and GROPAS. One of the major strengths of such models is that they incorporate the effects of both previous and current weather on future estimates of pasture growth. Such estimates are, however, of little use unless they are used in conjunction with estimates of feed supply and demand on the farm.

Feed budgeting techniques have been with us for many years but few farmers have exploited the technique to its full potential, mainly because time and effort are required. Also, many farmers feel that they can assess their feed situations accurately enough just by looking around the farm. There can be no doubt that many farmers are very good at this, but because of the conservatism of most of them, it does not usually matter because there is a buffer of feed in the system anyway.

For the farmer who wishes to exploit farm and stock to the full, planning is a must. The margins for error in management diminish rapidly as farming intensifies. The timing of calving, lambing or whatever, relative to feed supply and pasture growth assumes increasing importance.

A feed budget package called BUDGIT has recently become available for microcomputers. This program allows the user to tailor it to the conditions on the individual farm. The farmer can plan strategy knowing that the production characteristics of the farm are taken into account.

BUDGIT also allows the farmer to plan in detail such things as stock and paddock rotations; estimates of actual feed intake compared with target levels of feed intake; and pre and post levels of pasture cover determined. The farmer can look 40-60 days into the future and decide now what action, if any, needs to be taken to meet production targets.

New Zealand farmers in the future will not be the land developers they have been in the past; they will be land managers. All areas of management on the farm will change. In my opinion, microcomputer technology on the farm is for today. It has a major role to play in improving both production and financial management on the farm.

The farmer who waits until tomorrow may be too late. □

The experts all agree that the microcomputer has a definite place on today's farm, but what does the average farmer think? Not necessarily average is Richard Kidd, who won an IBM PC when he came third in the 1984 Skellerup Young Farmer of the Year contest, but he has definite views on the subject of computers and says he is not getting the maximum benefit out of it.

"Time is the problem," he states. "Farmers are isolated, and computers are time-consuming. It needs two hours minimum when working things out, and full concentration. It has to be convenient, and set up all the time.

"We wouldn't have it if we hadn't won it. Other farmers around here don't use IBMs, and it's important to check with neighbours and others in the district for compatibility of programs and techniques."

The Farmplan package was supplied with the machine, but Richard and Dianne Kidd found the Cashbook not really suitable for the farm, and bought the Lotus 123 for its spreadsheet. However, its complexity works against using it to its full potential, and the time and cost of attending a course in the city can't be afforded at the moment.

Now full-time at home after her teaching job at Kaipara College – their second son has just been born – Dianne plans to make more use of the IBM, perhaps taking in outside work. Not a typist, she has found it easier to do her textbook writing in longhand and have it typed, but the Wordstar has been useful for farm correspondence.

"Basically I see it for maintaining records at the moment," says Richard, "fencing and stock figures, not forecasting. A computer must be used for predicting and forecasting, but I'm not disenchanted. it will be a tremendous asset – it's just the lack of time."

Dianne and Richard Kidd of Helensville with their IBM PC. The newborn lamb is awaiting introduction to a foster mother.

Tomorrow's use of microcomputers

by Koos Baars,
Scientist, Ruakura Soil and
Plant Research Station,
Hamilton.

Computer use on farms in New Zealand is proliferating, but most often centres around programmes designed for accounting, record keeping and other single function tasks. These programs allow for routine data processing and help considerably in organising, storing and retrieving data. As expected, farmers, who were already used to record keeping before cheap micros appeared, use them in the most efficient way.

Present use of microcomputers represents the first phase of an evolutionary process, where micros can be used to increase the efficiency or reduce the costs of existing farming operations. Gradually wider implications of the micro's capabilities for on-farm decision support systems will be recognised and farmers will begin to exploit them in ways that change the nature of their work.

At this stage animal performance measurement such as liveweight, liveweight gains, and milk yield per cow are useful figures to indicate the health of farming operations. However, these signposts are the result of the interactions between individual farm characteristics, pasture growth and animal management. By describing the interplay between these three factors with a set of mathematical equations, significant key variables can be monitored and events perhaps influenced by manipulation.

If enough knowledge is available, a complex model of the farm can be constructed. Computer simulation is the scientific name of the process of conducting experiments on a model of a dynamic system like a farm. Until the coming of relatively cheap mirocomputers, the use of models was restricted to people working in universities, government departments and other large organisations, but with the arrival of cheap, powerful microcomputers all this has changed.

Simulation can be done in the farm office. The farm manager will be able to experiment with different weather patterns and farm strategies without risking the health of his animals, and get answers in terms of cash flow and animal performance. Similar techniques are used in military logistics and NASA space flights. The immediate purpose is to observe the behaviour of the farming system under a given set of assumptions, conditions and parameter values, while the ultimate purpose might be to formulate management policies or optimal economic strategies.

Simulation is an experimental technique, and as such there is always the serious question of how to interpret the results. It is important to understand that the validity of the output depends on the degree to which the model and the underlying assumptions reflect the system's characteristics.

However, simulation is vastly superior to simple feed budgeting, using programmes or spreadsheets. Simple feed budgeting is another first phase to come to grips with pasture and animal management. It should be realised by farmers that simplifications without considering the intricacies of pasture growth and animal production may lead to erroneous conclusions and useless output.

Simulation is vastly superior to simple feed budgeting

Micros now have the capabilities to make these models available to end users as a black box with a user-friendly shell, supported by powerful graphics. The black box consists of everything that is known about the system. It contains all equations which describe the relationships between system variables. For example, in the case of a model of a dairy farm, it will incorporate equations describing the relationship between herbage on offer, pasture quality, milk yield and stage of lactation. The user-friendly shell gives the user access to the model by way of flexible in- and output menus and editing facilities.

Of course it will be possible to monitor system variables over time, and get the desired tabular and graphical output on screen or printer. The graphical capabilities of micros for simulation models has hardly been used, but both IBM PCs and Macintosh offer exciting possibilities.

In future the farmer will use his micro to evaluate management strategies taking into account all interacting factors of his business. These will include both financial, and pastoral and animal factors. As in business, the factory and office will be linked. The farmer will also have access to data bases and compare his animal and financial performance with other farmers in the district. Preferably he will use an integrated support system, where data can be exchanged between models and financial packages and, where possible, to download data from mainframe computers to be directly used on his own computer.

The role of advisers and consultants will change dramatically. With the use of the micro the software becomes the expert. The farmer determines his needs and sets his objectives, and the machine helps him to achieve his aims. There may still be a need for assistance from a tutor or instructor to promote and support the self-initiated learning process, but that role is more passive rather than directive, allowing the farmer to follow his own ideas. This way the farmer becomes an active participant in any decision making.

For the scientist, models offer the opportunity to make new research information quickly available to the end user by regular updating. Similar systems are already used in feedlot type operations overseas. In Holland most dairy farms are fully computerised, with all cows completely recorded for milk yield, feed conversion efficiency, pregnancy status, disease status etc. Cows are fed according to daily reports.

The whole system is based on rigid use of information for strategic planning, and accomplishes the day-to-day activities most efficiently. Similar development can be expected in our grassland based farming over the next 10 years, especially now that the need for increased animal efficiency and cost reduction to control the cost-price squeeze becomes more pressing.

Speed of software developments

In Australia a model called SIRATAC has been used for more than four years by 80 per cent of the cotton farmers in Queensland and New South Wales. It predicts the growth and the yield of the cotton crop and the population levels of insect pests. A central computer and on-farm terminals are used to key in insect numbers for forecasts of pest numbers, and timely control measures are recommended. This has made pest control in the cotton crop far more effective.

The farmer determines his needs and sets his objectives, and the machine helps him to achieve his aims

It is only 10 years since Dr A. Wright from Massey University and a group of Ruakura scientists constructed a model of a beef farm, using card decks on a mainframe, but the use of models on micros on farms was never considered. In 1986 a commercial grass production model (GROPAS) and a feedbudget based on simulation techniques (FEED BUDGET) have become available for IBM PCs and compatibles. Reliable growth rates can now be calculated for individual farms for most pasture types throughout New Zealand, and the same applies to feed budgeting. Individual farm characteristics are fully considered in these models.

The next 10 years should see a marked increase in the use and application of integrated support systems consisting of models of farm systems, financial packages and direct telecommunication links with data bases.

Working partners for Commodore 128

Reviewed by Andrew Mitchell

Timeworks has taken three of its most successful products for the Commodore 64 and upgraded them for the C-128. Together they form a package that allows files to be moved from a spreadsheet or database into a word processor, thus giving versatility which the user may never have seen before. However, each package stands lone for specialised use.

Swiftcalc 128 (with Sideways)

This is the spreadsheet and has all the usual and expected features. However, with this and the other two programmes below there is the interesting way the menus are presented for particular options. Using the window facility of the C-128, Timeworks has created Macintosh type screens that zoom out to you from the top command line. It's really rather pleasant.

Some other features that may be of interest are minimum, maximum, average and sum values of a particular column; a series of financial analysis functions using interest rates and time periods; the use of IF... THEN... ELSE within a cell to decide its value; the ability to turn off the automatic calculating (this can save time on large spreadsheets); and locking cells.

no way of removing leading or trailing blank spaces

A print menu allows a certain amount of printer customising such as using compressed type to squeeze larger sheets on to normal width paper, but the best is yet to come. A stand-alone programme that comes on the disk allows you to take your previously completed and saved spreadsheet file and print it on your printer. No longer are you tied to the number of columns that will fit across your printer, but you can now print spreadsheets the length of your wall. (Well, not quite!) Not only does Sideways work with this spreadsheet, but it is claimed to work with any spreadsheet for C-64 or -128 that is created in a text file (ASCII) format when saved to disk. This includes Practicalc, Calc Now and Creative Calc, to name a few.

Data Manager 128 (with ReportWriter)

This database is one of the easiest I have used (and I've used a lot), while retaining most of the sophisticated functions I use frequently. Setting up your basic screen is simple, with there being a choice of only five types of fields (alphanumeric, numeric, date, calculation or text). I did not find this a limitation when setting up the standard database I use for such evaluations. The date, however, is in American format (MM/DD/YY) with no option to change to our way of use. To get around this I had to set up my own date fields using a combination of text and numeric fields.

Interestingly, each alphanumeric and numeric field must have a title, but you do not have to show the title on the screen. Each field is also allocated a number and it is by this that any searches done later are referenced, so I'm not sure why they have to be named also.

The feature for doing multiple searches is called X-Search. You are able to search your database looking for several matches at the same time. The example given is that you are looking for people who live in Auckland, live on Great South Road, were born between 11/11/11 and 1/5/53, and have between three and seven children. I couldn't find any documentation on how deep these nested searches could be.

For printing your data there are a number of options, from simple dumps to your printer, to creating files for use with WordWriter below, which is the ReportWriter part of the programme. A complaint I have with this and a number of other databases is that there appears to be no way removing leading or trailing blank spaces. This is annoying to say the least. I create the addresses on my databases with separate fields for street number and street name, because I need to sort by street name. The street address has to be least eight spaces in case the number is F15/1033, and I have some of these in my records. However, the usual case is simply 55, which means there are six blanks in the street number field, but when I print them out I don't want six trailing spaces before the street name! But as I've said, this is common to a number of databases.

No longer are you tied to the number of columns that will fit across your printer

You are also able to create files that can then be used to feed information into the spreadsheet described above. This could be quite useful for a company using the database to keep its salesmen's details during the month, and then transferring the figures to the spreadsheet for analysis.

WordWriter 128 (with SpellChecker)

You can guess by the name that this is the word processor in the package, and it has the option of using 40 or 80 columns, which neither of the other two has. Once again the pull-down menus make it fun as well as useful.

A fancy addition is the use of a calculator (only in 80 columns) which superimposes on the screen. It looks just like the one you carry in your pocket and is used the same way, allowing you to do calculations while creating documents, and you are able to transfer the last figure to appear on the display to your document.

When typing in this word processor your text stays with the document size formatting you have chosen. This means that if you are going to print 60 columns on your printer, and establish that before you start typing, as you type word wrap will occur at 60 characters, so you can see exactly how your document will look when printed without using the further view document option provided with other processors. This also includes page breaks to show where any splits due to top and bottom margins will occur when printed. Rather a good feature I thought, although a little difficult to come to grips with after so much use of the other sort.

All the other functions are fairly standard, and the spelling checker is no slower than any of the others, so there's nothing to complain about. They're all dead slow!

It all makes a useful addition to your C-128 collection if you don't already have these types of programs. If you do, then you probably wouldn't want to bother. If you're in the market for a spreadsheet, database or word processor then these are certainly worth considering, but ask your dealer for a demonstration, or at least enough time alone with the particular program and manual to have a look at the sample files that come with each.

(Review copies provided by Commodore Computer (N.Z.) Ltd.)

LETTERS

Interactive video progress

Dear Sir,

Your UK Report No. 2 (July) makes interesting reading on the subject of interactive video. As stated, full exploitation of video disk does depend upon an "intelligent tutor" to drive it. The potential of the resultant combination is certainly diverse; with major implications in storage and access of documentary and photographic data. Training and customer-service applications are readily envisaged.

Your reporter, Pip Forer, was evidently unaware of the advances mode by Helix Expert Systems Ltd of the United Kingdom in the development of Expert Edge Professional. This rule-based expert systems shell is designed to run on IBM PCs or other IBM PC compatible micro-computers with at least 384K of memory. Amongst other features, Expert Edge Professional possesses an interface enabling video disk material to be dynamically and selectively accessed at any time during an advice session.

At the time of writing, Templar Software Limited is preparing for a visit from Joe St. Johanser of Helix Expert Systems Ltd. During his visit to New Zealand, he will be leading a two-day seminar in Auckland on Expert Systems and holding talks with banks and other financial institutions.

Yours sincerely,
Chris St. Johanser,
Templar Software Ltd,
Auckland.

Helping words with WPL

by Paul Left

Every month when I sit down to write this column, I use a word processor which has been around for years: AppleWriter II. Integrated software like AppleWorks and word processors with WYSIWYG (what you see is what you get) have taken over in the Apple II market to a great extent, but AppleWriter has its own unique features.

Built into the program is a mini-interpreter which allows you to run programs in WPL (Word Processing Language) even while editing a file. For the writer who enjoys a little programming, or the programmer who enjoys a little writing, WPL provides the means to speed up and simplify the writing process. The language is limited in vocabulary and the commands can seem rather cryptic, but WPL is easy to use and learn.

Its main use has been in mail-merge tasks, where a form letter is customised for a number of people. There is a sample of this type of program supplied with AppleWriter, along with other examples of its use. This article looks at the use of WPL to save time when writing and formatting documents, with a corresponding improvement in the appearance of the finished article. Two WPL programs (MEMO1 and MEMO) are listed, which will allow you to automate part of the process of writing short memos.

WPL programs are written using AppleWriter and saved in the normal way. Then they are run from the editor and the commands are executed as they are interpreted. In general, any statements which WPL does not recognise do not produce an error condition but are merely ignored. The commands themselves are abbreviations and correspond to editor commands. For example, NY has the same effect as the editor command Control-N Y, which clears the workspace for a new file.

As AppleWriter commands are generally fairly logical and mnemonic (unlike WordStar's powerful but rather bizarre command-structure), programming in WPL is not too hard if you are familiar with AppleWriter. The language is quite unlike BASIC, and writing the code bears some resemblance to using an assembler/editor even though WPL is definitely a higher-level language than 6502 assembler.

Listing One shows a very simple program which prints two files as if they were one. Notice that each line is indented, which is mandatory, and that print commands (which are accessed with control-P in the editor) all begin with a P. For example, PNP means New Print and PCP means Continue Printing. All commands are in capitals and there is only one command per line. Notice that in this example the two files are loaded from different drives as specified at the end of each filename after the comma.

LISTING ONE:

```
Lfile1
PNP
NY
Lfile2
PCP
```

Power of variables

The real power of WPL lies in its use of variables and use input to modify text files. In Listing Two (MEMO1), the PPR command prints the following text; in this case, the ^ represents a control-L character which is entered by typing control-V, control-L, control-V. The control-Vs are necessary as control-L is normally a command, and they force the character to be inserted as text rather than treated as a command. This control-L will appear as a flashing L on most displays, but will clear the screen when the program is run. The PIN command prints the following text on the screen, and reads user input into the variable after the equal sign. In other words, the command is equivalent to the BASIC command

INPUT"enter recipient:";A$

LISTING TWO: MEMO1

```
PPR^
PIN enter recipient: =$A
PIN enter date: =$D
PIN enter topic: =$B
PIN enter sender: =$C
PPR^
LMEMOFORM
B
F/*N/$A/A
B
F/*D/$D/A
B
F/*T/$B/A
B
F/*S/$C/A
E
G?d$D
G?D$D
G?a$C
G?A$C
```

After the user has typed the four values, the file MEMOFORM is loaded, the B sets the cursor to the beginning of the file, and the F commands look for all occurrences of various strings and replace them one by one with the values typed in. For example, the first of these finds all occurrences of *N, and replaces them with the contents of $A, which is the text typed as input. After all four replacements have been made, the E command places the cursor at the end of the file buffer ready for text to be appended.

LISTING THREE: MEMOFORM

```
.cj
MEMO

To: *N                          Date: *D

Re: *T

From: *S
.lj
```

Let's leave the G commands just for now, and look at the application of this program. Listing Three shows MEMOFORM, which MEMO1 loads and modifies. The file is a heading for a memo, and the items beginning with an asterisk (*N, *D, *T, and *S) are the words which are replaced by the correct values (stored in $A, $B, $C, and $D) when MEMO1 is run.

Notice also the use of three 'dot' commands (.cj, .lj and .fj) for formatting the heading. Not visible in this listing are embedded control characters on either side of the replacement items. For example, my MEMOFORM file has the sequence escape W1 before the *N and an escape WO after the *N, which turns on and off the wide-print feature on my dot-matrix printer. The other three items have an escape E in front and an escape F behind, which controls the emphasised-print feature. When MEMO1 is run, the new values are squeezed in between these control characters, replacing the * items. Don't forget that control characters, including escape, must be preceded and followed by control-V characters. The escape will appear as a flashing square bracket or a graphics character on most displays.

Once you have the three files (MEMOFORM, MEMO1, and MEMO) on disk, you don't need to Load MEMOFORM to start writing. Just type a control-P, and in answer to the prompt type DO MEMO1. This runs the program, which will ask you to type in the recipient of your memo, the date, the topic, and your own

LISTING FOUR

MEMO

To: P. Kleinzeit Date: July 28 1986

Re: New banana sorting machine

From: A. Megalo

name. Then MEMO1 will load the file and insert the appropriate text in the heading, ready for you to type the body of the memo itself. If you entered the appropriate control characters when creating MEMOFORM as described above, your finished memo should resemble Listing Four.

You could of course do the substitutions in MEMOFORM yourself, but it is much quicker to let WPL do it for you, and once you have a format which pleases you, all your work will be consistently attractive and well-organised. Notice that the use of emphasised print lends clarity and legibility when sparingly used.

Now to deal with the G commands in the MEMO1 listing. The G is a glossary command, which (when followed by the ? character) tells WPL to treat the following text as a glossary definition, with the first character as the key and the rest as the text to substitute. The last four lines of this program, then, assign the current date and the name of the sender to the glossary and you can then type control-GD or control-Gd to insert the date in your text, or control-Ga or control-GA to insert your name. An important point here is that the glossary is not affected by a NEW (control-NY), so that this glossary definition is available for the rest of your writing session, until you either quit AppleWriter or redefine the glossary.

LISTING FIVE: MEMO

```
        PPR^
        PIN enter recipient: =$A
        PIN enter topic: =$B
        PPR^
        LMEMOFORM
        B
        F/$N/$A/A
        B
        F/$D/$D/A
        B
        F/$T/$B/A
        B
        F/$S/$C/A
        E
```

In Listing Five, we see a modified version of MEMO1 called MEMO. This does not ask for the date or your name, but makes the same substitutions in the text as before, without defining glossary items. Therefore, if you run MEMO1 for the first memo you write and thereafter use MEMO, you will need to type your name and the date only once in every writing session. MEMO will automatically insert them into the headings of your memos, and you can use the glossary to access them into the body of your memo or any other document you write.

The ability of WPL to automatically replace text is a powerful writing tool which need not be confined to mail-merge operations. It is possible to create a document (such as MEMOFORM) and a WPL program (such as MEMO1 and MEMO) to automate many types of documents. Letters are obvious examples, but any document which is created regularly and which has a standard format but requires individualised content, is worth automating.

It is important, however, that this is used to assist the writing process by freeing us from the repetitive or mechanical tasks involved, so that we can concentrate on the writing itself.

Laser for speed by Craig Beaumont

Do you want increased execution speed without having to learn another language? If so, then the Laser Basic Compiler by Ocean IQ might be what you're after. It can compile Locomotive Basic programs that don't use floating point arithmetic and boost their speed by up to 10 times – depending on what the program does.

As an example the Sieve of Eratosthenes was used to find and print the prime numbers less than 5000. The results are summarised in this table:

	Time in Seconds	
	Finding	Printing
Loco Basic	52.1	21.6
Compiled Basic	4.1	9.5
Hisoft Pascal	4.8	8.4

Laser Compiled Basic stacks up well against Hisoft Pascal and is a radical improvement over the interpreted Loco Basic. The executable code occupies 7K for both compiled Basic and Pascal, as against 1K normally.

The Laser Basic Compiler is very simple to use. You develop your program as you would normally, and when you wish to compile it just save the program as an ASCII file using SAVE"PROG",A. Run the compiler and follow the prompts, and within minutes you will have a pure machine code version of your program. That is, unless your program has bugs, in which case these will be pointed out with a brief but helpful message.

You may notice in the attached program that a backslash is used rather than the normal division sign in lines 130 and 180. This is done so the program gives the same results whether interpreted under Locomotive Basic or compiled by the Laser Compiler. Also line 110 is a target for the implicit GOTO in line 50, which is necessary as the compiler does not accept GOTOs to WENDs or NEXTs.

All commands that use floating point arithmetic like COS, LOG10 and commands to the interpreter like TRON, AUTO etc. are not understood by the compiler. Other commands like TIME and RND give slightly different results to Loco Basic. Some time may need to be spent in converting programs before compiling them. The compiler can use RSXs if these are loaded by the compiled program during execution.

Laser Basic is a set of graphics and sprite extensions to Loco Basic, also produced by Ocean. It enables you to produce games of a high standard. Programs that use Laser Basic can be compiled by the Laser Basic Compiler giving them a further increase in speed. The largest input file the compiler can handle is 22K, but the amazing demo program that comes with the Laser Basic Compiler shows that this is not a great constraint.

Elite

When Elite came out on the BBC, some said it was worth buying the machine just to play the game. The only difference with the Amstrad is that the machine is cheaper. The Amstrad version is produced by Firebird, a trademark of British Telecom. The program comes with a 60-page manual on the control of your Cobra spaceship covering navigation, combat, weaponry, trading, planetary politics and a guide to the capabilities of other ships you will encounter. A novelette to set the scene and give some hints is also included, along with a ship identification poster and a quick key guide.

The aim is to become a member of the elite through smart trading and skilled combat. Starting with little weaponry or cash and with a rating of harmless, there are two main paths to reach the rank of elite – that of the honest trader or that of the merciless pirate. To equip your ship you initially trade among friendly planets in legal commodities like food, radioactives and machinery.

Once you are fully armed you may take the path of piracy – destroying other traders and picking up their cargo. Great profits can also be made through blackmarket trading in goods like slaves and narcotics. This path is fraught with risk as the police and bounty hunters are soon on your tail. If you are successful it is the faster route to elite status.

Elite is a true epic. The Elite universe has eight galaxies each with many planets, and to really explore it will take many hours. As the game progresses and your rating increases you will be asked to perform missions. If you complete these successfully your rating will benefit. This is one game I don't mind waiting for ten minutes while it loads.

I recently received a Cirkit Modem from Britain. It is a cheap entry into computer communications at a total of £50 including Prestel software. It connects directly to the expansion port and has a port that can interface with RS232 devices. The phone connection is an acoustic coupling that fits the old style phones snugly. I'll have more details on this next month when I've used it more.

```
10 REM Sieve of Eratosthenes.
20 MODE 2:DIM prime%(5000)
30 start=TIME
40 FOR i%=2 TO 2500
50 IF prime%(i%)=1 THEN 110
60 j%=i%+i%
70 WHILE j%<=5000
80 prime%(j%)=1
90 j%=j%+i%
100 WEND
110 REM target for goto
120 NEXT i%
130 calc%=(TIME-start)\3
140 start=TIME
150 FOR i%=2 TO 5000
160 IF prime%(i%)=0 THEN PRINT i%;
170 NEXT i%
180 prin%=(TIME-start)\3
190 PRINT
200 PRINT"Calc time ";calc%
210 PRINT"Print time ";prin%
220 PRINT:END
```

Achieving success with software

by Ann Frampton

Over the last few years, the use of computers in education has moved away from the idea of using computers to teach programming, or to teach about computers, to using computers as a tool to facilitate learning. In other words, the computer is no longer the object of the learning, but the instrument which enhances the learning.

While this is a positive step, and has meant that the computer is beginning to take its place in the classroom as an aid to learning alongside the tape recorder, overhead projector and even books, it has meant that much more emphasis has now to be placed on software, both in choosing a machine for a school and in determining how it will be used in the classroom.

A large number of companies are selling software, and while there does seem to have been some improvement over the last year or two, one is still inclined to agree with a writer who said that 99% of commercial software is junk.

What, then, makes that one percent stand out, and what sort of criteria should teachers use when evaluating software?

One trend, which seems to be becoming daily more popular, is a focus on open-ended, content free software which enables the computer to be used as a tool in a large variety of ways. Let us consider for a moment the applications of a word processor in a primary classroom. It can be used to present reports or projects for Social Studies in a neat legible format. It can be used for process writing, using the editing facilities to enable students to keep on changing their work until they are completely happy with it after conferences with their peers and teacher, without the tedious business of rewriting the whole thing each time.

The search and replace facility can be used as part of a language lesson on, say, alternative words for the over-used "said". The computer will find all of the "saids", and at each one ask the student if they would like it to be replaced. A format for book reviews could be stored on disk, and used either on or off the computer by students to create a file of class book reviews. (Of course, this may lead on to database work where students can store the information in a way which they can later access, for example to find other books by the same author.)

Then there is the use of a word processor to teach keyboard skills, to create text for branching story programs, or for producing a class newsletter or noticeboard. In fact, the possibilities are endless. I am sure that a creative teacher could think of half a dozen more without trying very hard. With only one piece of software such as a word processor a computer could be kept occupied in a school very effectively from early in the morning until late at night.

Other pieces of software which offer a wide range of class activities include branching story programs, adventure or interactive fiction programs, picture editors, and programs such as Printshop, the Newsroom and Fleet Street Editor which enable students to combine text and graphics to produce newsletters or notices.

So one of the ways to recognise successful educational software is to look for open-ended programs which can be adapted to suit the classroom.

This does not mean that content-specific software is of no use, but rather that more care must be taken in selecting programs which are likely to work in your classroom. It is important that the teacher has an opportunity to use the software and evaluate its application in her own situation.

One of the problems in New Zea-

land is that a large amount of the available software comes from Britain or the United States, and is often not related to our curriculum. Learning all about the northern hemisphere stars or Scottish farming may be very appropriate in other countries, but not as appropriate in New Zealand classrooms. Even programs which appear on the surface to have no such bias may prove to be unsuitable. For example a good quality early reading program uses "skunk" and "sidewalk", two words which are hardly likely to be part of a Kiwi five-year-old's vocabulary.

Once the teacher has ascertained that the content of the software is suitable to the needs of her class – and presumably this will also include a positive evaluation of the level of the content – the next step should be to determine whether the computer is an appropriate medium for teaching the particular content or skills involved. Too often in the past the computer has been used as a very expensive electronic worksheet or page turner. The teacher should ask, "Could this material be taught as effectively another way?" If the answer is "yes", then the computer is probably not the right medium to use.

It has been my experience that students who have spent some time using computers and are past the novelty stage do not find tutorial or drill type programs very stimulating, and tire of them very quickly. In addition, these programs are often only suitable for a small number of students for a limited period of time. Can you justify the purchase of a program which may be used with half a dozen students for half an hour each in a whole year, or will you put everyone through it anyway so that they "get their turn on the computer?"

The exception to this brief appeal of tutorial or drill programs is when an element of chance or competition is involved, either against other students or against the computer. Educational games can be very powerful learning tools. Programs which enable groups of students to work together to solve a problem, often taking different roles, discussing possible actions and their consequences, and making joint decisions, provide opportunities for social interaction and spin-offs into other language, reading, art and drama activities.

In spite of my belief that open-ended software and games involving group work based around simulations or interactive fiction are the most appropriate ways of using a computer in a classroom, there is nevertheless a place for the software which tends to be both less expensive and more plentiful. It has been said that a creative teacher could make a good lesson out of a piece of string, and the same is surely true of a piece of "not-so-good" software.

The recent article in *New Zealand Mathematics* magazine, which described how a teacher of a fourth form maths class went from a simple computer program which demonstrated slopes to using clinometers to measure the slope of surrounding hills and a discussion with a local tractor salesman about farm safety, is a good example of how software can be used as a "hook" which leads to an investigation of all sorts of other interesting things.

I have confidence in the ability of New Zealand teachers to make good use of such software, but the question must be asked, what should the priorities be? Even in secondary schools there are not sufficient computers to meet all of the potential applications. How can the computer be best used to fit in with the educational aims and objectives of our schools? I would venture to suggest that the open-ended programs are more likely to be appropriate to our situation. It is the word processing programs, picture and text editing systems and interactive fiction programs which are capturing the imagination of the pioneers in our schools today. These are the most likely to succeed because they can be used in as many different ways as there are teachers in schools.

Finally, a mis-quote from an ancient proverb. "No piece of software is entirely useless. It can always serve as a horrible example." ☐

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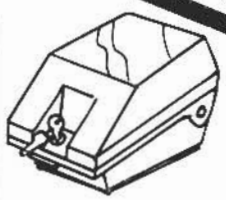

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Multi-user Update

by T. Mark James

In recent weeks several new developments have taken place concerning the multi-user microcomputer operating systems which we have been considering in this column (and also UNIX, the subject of next month's column). This month will be devoted to bringing us up to date with the multi-user news.

UNIX

American Telephone and Telegraph (AT&T), the developers of the UNIX operating system, introduced UNIX System V Release 3 at the National Computer Conference in June. Improvements over Release 2 include support for two new filing systems, the rudiments of a networking capability (which might be fleshed out in future versions), and some detailed specifications as to how UNIX application programs are to interface with the operating system.

The two new filing systems, stream and RFS (remote file sharing), had been awaited with some anticipation by the UNIX community. At least one marketer of an add-on database product that runs under UNIX had claimed that the new release would incorporate its database. However, AT&T did not endorse anyone's product.

The application interface specifications caused some surprise and consternation. UNIX has long been hailed as an open operating system, one that is not tied to any one particular hardware manufacturer. While this was true when UNIX was developed, AT&T has been selling its own brand of computers, the 3B series, for nearly three years now, and other users have worried that A&T would now seek to control the operating system for the benefit of 3B hardware sales. X/Open, a group of European computer makers, is concerned that the new interface specifications may be an attempt to police the market.

Others, however, have welcomed the new specifications. UNIX has suffered from a large array of incompatible versions or flavours of the operating system, and the new standards should help reduce the problems in moving programs from one flavour to another.

PICK

The PICK operating system, although technically portable across a wide range of hardware, has long been associated with individual hardware manufacturers or marketers, each of whom is licensed to sell PICK on one or more types of hardware. The problem has been that the implementations of PICK vary from one manufacturer to another. An organisation called the Spectrum Manufacturers' Association has been set up to encourage standards, and held a trade show last March.

One of the exhibitors at the show was VMark Computer, whose product, called Universe, implements PICK as a UNIX shell. VMark, however, is the target of a lawsuit by Pick Systems Inc, the developers of PICK, alleging copyright infringement.

Pick Systems, meanwhile, is said to be testing the next version of its operating system, which will be called Open Architecture. The major enhancement will be an ability to communicate with other computers while a full-screen editor is also rumoured.

A new version of PICK for the IBM PC/XT has been released. Although not of the Open Architecture class, it does permit the copying of files between PICK and MS-DOS, where previously there was no way to share data between the two operating systems.

BOS

Speedbuilder, an application generator that runs under the BOS operating system, was introduced in this country in July. Speedbuilder allows either simple or detailed database structures to be specified, then generates code in BOS's Microcobol language. The database specification is done using a record and screen definition procedure that includes automatic totalling and the ability to link and cross-update different record types (customers, orders and invoices, for example).

The generated programs use the BOS Microlink database, which has been repackaged under the name Speedbase. Speedbase is a network-structured database manager which allows either incremental or full backups and restores, and supports record locking for multi-user applications.

Once the database definition is done, Speedbuilder generates the application code in a matter of seconds. It does not, however, actually set up the database, nor does it automate any of the housekeeping functions necessary under BOS, such as file size declarations and reorganisations. These still require the intervention of someone who knows the BOS system.

Speedbuilder is therefore not an end-user tool. Roger Watson, managing director of BOS Software (NZ) Ltd, says that Speedbuilder is targeted at software developers who wish to produce packages quickly to run under the BOS operating system.

AMPS

Advanced Management Systems Ltd, the developers of the AMPS system, have announced a new release of the AMPS query and report writer package, called AMQ. The major new feature is that database queries and generated reports may be saved (in the form of compiled programs), placed on menus and run directly. This means that AMQ may be used as a programmer's tool as well as an end-user database query facility.

AMASS, the AMPS spreadsheet, has also been enhanced. In addition to a general speed-up, the spreadsheet recalculations may now involve very complicated formulae, including calls to external programs and the ability to read and write database records external to the spreadsheet itself. The size of the spreadsheet is still limited to 1200 cells, however, placing a constraint on the kinds of business calculations that its new features can address. ▢

More about Prestel protocol

by Geoff McCaughan

Q & A is a regular series in **Bits & Bytes** in which we do our best to answer a selection of questions from our mailbag. Why not send yours in today? Post your questions to:

Bits & Bytes Magazine,
PO Box 9870,
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Subject: Cyclic redundancy check

Q: What is a 'Cyclic Redundancy Check'? Is it a form of checksum?

A: A Cyclic Redundancy Check is a method of calculating a checksum which is a little more sophisticated than simply adding the bytes of a file modulo 256 or 65536. CRCs are usually found in I/O type operations where there is a possibility of data becoming corrupted. Some operating systems assign a CRC to all programs in memory so they can check if a program has been corrupted each time it is called.

There are a number of common algorithms used for CRC generation, so it is important that you know exactly how to generate the correct CRC for any particular application. In general, data is shifted into a 16-bit accumulator bit by bit and is successively exclusive ORed with a 16-bit polynomial which itself is shifted or rotated according to the bits being shifted out of the accumulator. The object is to generate a unique checksum with the least possible processor overhead.

CRCs are useful for detecting data corruption because it is extremely unlikely that data which has been altered in any way will produce the same CRC value, much less likely than a simple checksum. I have yet to see a mathematical treatment of CRC efficiency, but it would be interesting to know just how much better they were, enough to justify the extra work involved in generating them. I imagine someone somewhere has done it, and I would be interested to see the results.

Subject: Education

Q: I am thinking of making a career of computer programming. What languages should I learn?

A: That really depends on what you're doing now, and what area of computing you want to get into. If you are still at school I would expect that you plan to carry on to university and get a Computer Science degree, in which case you should have little difficulty finding a suitable position. Learning a few more languages than you are taught at university may not be a bad idea all the same.

If you have several years' experience in business or industry, preferably with some computer experience, a degree may not be necessary. Assuming you can already program in BASIC or something similar, I would recommend that you learn to program in at least two other high-level languages and assembler. Do not make the mistake of thinking that because you know BASIC you can just walk into any old programming job.

Another possibility is an extramural university course, which can be done part-time, but as yet the offerings are very limited in this area. Polytechnical schools often run computer courses, but get the advice of someone knowledgeable before you embark on one. I have seen a number of Polytechnic computer courses that leave a lot to be desired.

Different languages are used in different areas. COBOL is widely used on mini and mainframe sites, Modula 2 and PLM are common in real-time and automation processing, C is being used more and more for serious micro work. BASIC and fourth generation languages (mostly of the 'paint by numbers' variety) are widely used for the more undemanding jobs. The choice of language you propose to learn will also be determined by what is available for the computer you are using, but it is probably less important to learn a particular language than to be able to competently program in a number of different environments. Once you can do this you will probably find you are reasonably confident about picking up a new language quickly. As well as languages, I would suggest that exposure to several different operating systems would be beneficial.

Whatever you learn at present, you will have to face the possibility that your knowledge will be largely out of date within five years, and continual re-education will be necessary if you are to keep up with current trends. One can take some comfort, therefore, in the fact that while languages, operating systems and hardware will change, the problem-solving creativity of a good programmer is a unique discipline which will always be required, and it is something that once learned, is never forgotten.

Subject: Prestel protocol

Q: I would like to write a Terminal Emulator for videotex. Where can I find out more about the Prestel protocol?

A: You should be able to obtain the type-approval specifications for videotex terminals from your local Post Office which should tell you most of what you want to know.

The prime limitation when writing a videotex terminal is the ability to generate the split-speed 75/1200 Bps RS-232 (seven data bits, one stop, even parity). If you can do this the rest should be plain sailing. Prestel uses a modified ASCII character set and switches colour and graphics on and off with escape codes. The escapes themselves are not printed, but the character following takes up a screen space (weird!). The screen should be 24 lines of 40 characters, but each logical screen line must have more than 40 bytes storage assigned in memory to allow for the variable number of escape codes that could be on a line. Escape codes apply only to the line which they are on, i.e. they are terminated by a carriage return.

A minimum terminal might ignore the colour and graphics information and just display text. One thing the PO specs don't mention is that the screen should be wrap-around, i.e. moving down from the bottom line puts you at the top of the screen, and moving up from the top puts you at the bottom.

As there is some processing overhead and you will be receiving data at 1200 Bps, you will probably find that BASIC is not up to the job unless it is compiled.

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Subject: DOS
System: Commodore Disk Systems

Q: Why do Commodore disks allocate sectors in non-numerical order? A file will have sectors in something like this order: 1,11,2,12,3,13 etc. Surely it would be more efficient to allocate them consecutively?

A: Commodore uses a unique disk format called Group Coded Recording (GCR) which is different from the more common formats in a number of ways. One of the major differences is that the number of sectors varies according to the position of the track (less towards the centre), thus making more efficient usage of the disk space. Evidence of this efficiency can be seen in the Commodore 70 track double sided drives, the 8250 and the more modern SFD 1001, both of which put just over a megabyte on a 5.25" floppy.

If one is to have an efficient disk drive, there is more to the job than packing lots of data onto the disk. It must be accessible quickly. You can imagine the disk controller as someone in the middle of a bucket brigade, grabbing a sector off the disk and passing it on to the computer. As might be imagined, it takes a finite amount of time to pass the data to the computer, and in that time the next sector on the track could well have passed the drive head, in which case the disk would have to make another full rotation before the next sector can be read. A solution to this problem would be to assign sectors to a file non-consecutively, so that the next sector was just coming up to the drive head when the controller was ready to read it, which the engineers at Commodore apparently did.

This was all very well for the earlier generation of Commodore IEEE 488 drives which communicated with the computer at a respectable clip, but unfortunately for several million present-day Commodore owners, a more pedestrian serial communication bus was designed into the 1541 generation of Commodore drives, presumably to keep costs low. One can well imagine that the efficiencies of the GCR system are consequently somewhat under-utilised. There is one advantage, though, as there are now numerous third-party programs and add-ons which speed up the these drives by as much as 14 times, by which time one needs all the efficiency one can get. Thankfully the new generation 1570 series is capable of much greater speeds.

Nowadays the tendency is toward larger disk buffers which allow a whole track to be read at once, and Direct Memory Access (DMA) drive controllers which handle disk I/O with a minimum of processor intervention.

Subject: Communications

Q: I have a modem and would like to contact BBSs. Do you have a list of BBSs available in NZ?

A: There are quite a number of BBSs operating now. I know of a few, but I don't imagine I know them all, and in fact I don't know if anyone has made up a list of all the systems currently operating. I will see if I can put a list together to be published in an upcoming issue.

SYSOPS PLEASE NOTE! If you want your system to be on the list write with brief details of your system, (protocols, Bps, operating times, charges etc) and remember to include a postal address.

Calling a remote BBS can be expensive on a standard toll line, so it is best to call after 10.30 pm to take advantage of off-peak rates. Note that most systems will require some form of subscription before allowing you full access, but very few have online charges.

Subject: Disk Integrity

Q: I am worried about stray magnetic fields affecting my disks. Is there a material that will effectively shield magnetism?

A: Well yes, sort of. Most metals will operate as a 100% effective magnetic shield when cooled to their superconducting region (approx 10 degrees or less Absolute). However, a cryogenic disk storage box would present several other problems which make it a trifle impracticable.

The problem with trying to shield against magnetism is that the best materials for the job (at sensible temperatures) are all strongly ferromagnetic and can become magnetised themselves which increases rather than decreases the problem.

It might be instructive to deliberately try to erase a disk (one with no useful data on it, of course). You will probably find it is much more difficult than you thought. Floppy disks are usually quite safe unless they are stored in an area of unusually high flux density, and remember that a changing field is much more likely to demagnetise than a static one. Colour TVs (and monitors etc) have a degaussing coil mounted around the front of the tube which operates when you switch the set on. This can effectively erase disks which are sitting too close, but the strength of a magnetic field falls off rapidly with distance, and normally sources such as this pose no problem.

I would suggest that if you are really concerned about the environment in which you use your disks, you should keep frequent backups and store your backups in a data protection cabinet where they should come to no harm.

NZPO changes to BT plugs and sockets

The New Zealand Post Office is changing its standard for the connection of data equipment to its lines in subscribers' premises. The British Telecom (BT) plug and socket has replaced the APO for new connections from the beginning of last month.

A demand will now exist from NZ modem manufacturers and PO customers for BT line cords. NZPO policy is to install BT jacks for all new connections from the changeover date, and also to change, free of charge, the existing line connection to a BT when changing PO-owned data equipment, either when changing type or replacing existing equpment.

However, where the customer applies for an internal or external removal, it is his responsibility to fit a BT line cord in privately-owned data equipment.

Plans for Charter series

David Harris, managing director of Chevron Software of Tauranga, which has bought all the NZ rights for the Charter series of accounting software from PAXUS Commercial Systems, says he is very pleased to have secured the rights. "It is a well established and proven product and has been given extended versatility with the recent release of the magna Charter networked version," he points out.

With its main office in Tauranga, Chevron will also maintain a small Auckland office. "We have been fortunate to secure the services of some key personnel from PAXUS which will allow us to quickly establish a high level of service and support," says Harris.

He states that Chevron will embark on a "fairly extensive" programme of enhancements and modifications, adding new modules and looking at a number of options. "We see the market as four segments – CP/M, MS-DOS, networking and multi-user. We don't as yet have a true multiuser, but we're looking at that."

Chevron has purchased the Charter product outright, with exclusive NZ rights, and has added full modifications to handle GST, as well as Family Support changes to the payroll side. "Because of the flexibility, the changes are not dramatic," according to Harris. "The system is flexible enought in its own right to handle GST. The major thrust of the modification has been in invoice handling, and the GST upgrades are now in the hands of the dealers.

"We're looking to supply good support to the established user base. Charter is very much alive, and we're looking to supply the market through the dealer network – dealers are the first line of support – or third-party support consultants."

Polydimensional arrays

by Joe Colquitt

A little while back I showed the usage of one-dimensional arrays (subscripted variables) and their value as storage areas for values to be transferred en masse to a sprite, sound, table etc. These arrays are used mainly as a total unit, ie the whole array is shifted with a loop, and individual elements are not frequently selected.

The topic for this column is that of polydimensional arrays. Probably the most often used are 2-D and, less often, 3-D, arrays. To the best of my recollection I don't think I've ever seen a program (in BASIC anyway) that used 4-D or greater. I can't immediately foresee the use for 4-D arrays, but I daresay someone, somewhere is using one.

As an example, say you had the 2-D BASIC array A(5,3), perhaps holding the values of six throws of four dice (remember A(0,0) is the first element). This is a simple array to use in BASIC, access to the element being gained by simply specifying the name of the element eg A=A(3,1) and so on. If you've spent some time on the keyboard end of an assembler, you must know it's not going to be that easy in ML. Regardless of how BASIC uses arrays, if you want to write them into your ML routines, you are going to have to devise a system that suits the particular application. I can supply a general method, but the nuances will rear their ugly heads only in your programs.

In this general method, the logic is quite simple, and applies to a WORD array, ie each element of the array is a pair of numbers. This is more useful than a BYTE array, as each element can hold a two-byte address, two characters,a number in the range –332768 to 65535, or any other data that can be stores as two bytes. The equation for finding the address in the array of a particular element is straight-forward enough:

ELEMENT ADDRESS=BASE ADDRESS+ (ROW SUBSCRIPTION*ROW SIZE) + (COLUMN SUBSCRIPT*2)

The array is assumed to be in ROW MAJOR order, ie the first dimension in the array is the number of rows. Fig 1 shows the array A(5,3) in row major form. Element 4, 2 is calculated by Base+(4*8)+(2*2), the pair starting at the 36th byte, remembering that the first byte is BYTE 0.

The commented source code of Routine 1 is the practical program to accomplish the calculations. 'Shift and Add' algorithm maths was covered in the October/November articles.

The result of using Routine 1 is that you now have the address of the element in $FB/$F9 in low/high format. The routines following it are suggestions for using the address. Routines 1a/b need some explanation, as the pre-indexed (indexed indirect) instructions are a bit tricky for the first time user. To illustrate their operation, we can use Routine 1 below as the core of a table-based menu for printing strings.

Assume that the array set up is ARRAY (5,3), shown in fig 1. The address of element (4,2) has been found by routine 1 ($C124), and put into $F8/$F9, ie $F8 contains 24 and $F9 contains C1. Now the tricky part. LDA($F8,X) PEEKS the address, contained in the pair $F8/$F9, with an offset provided by the X register (none in this case). So the flow is like this (X=0):

LDA($F8,X) – Accumulator=PEEK ($C124)=#C2
TAY – transfer this to the Y register
INC$F8 – the pair $F8/$F9 now contains $C125
LDA($F8,X) – Accumulator=PEEK ($C125)=#00

The situation is now that A=#00 and Y=#C2. When $AB1E is called, the string starting at $C200 is printed.

If X=2, then the pair $FA/$FB would be looked at, and so on. Therefore, every time X is increased by 2, LDA($F8,X) looks at the next pair. This method allows a remote array/table to be referred to by zero page pointers. Notice that in this particular instance, the addresses in the array are stored as high/low, not the usual low/high. This is to compensate for the way that they are extracted by routines 1a/b. Use the BASIC runner with routine 1 and an array table of your choice.

The example I've given uses an address array 5,3 starting at $C100, with the base address ($C100) stored at $9E/$9F in low/high format. Only element(4,2) has been defined. Although I've referred to this array as (5,3), there is no actual definition as there is in BASIC. The block can be referred to however as you see fit. It can be two rows of 12, three rows of 8, four rows of 6, six rows of 4, eight rows of 3, and so on. The following responses to the prompts will all return the address of the 36th byte: 2/18/0, 4/9/0, 8/4/2, 16/2/2, 32/1/2 or 64/0/18. Each set of responses configures the block in a different way, and the relative position of the 36th byte pair is determined by that configuration. Talk about flexible!

Routine 1a:print string

```
C047 LDX#$00     :set pre-index
C049 LDA($F8,X):get ? address low
C04B TAY         :
C04C INC$F8      :bump index
C04E LDA($F8,X):get ? address high
C050 JSR$AB1E  :print string
C053 RTS         :
```

Routine 1b:menu

```
C047 LDX#$00     :set pre-index
C049 LDA($F8,X):get JSR address hi
C04B STA$C057  :store
C04E INC$F8      :
C050 LDA($F8,X):get JSR address low
C052 STA$C056  :store
C055 JSR$hilo  :GOSUB
C058 ....
```

Fig 1:ARRAY(5,3)

```
   column    0      1      2      3

row0 C100 .. .. .. .. .. .. .. ..
   1 C108 .. .. .. .. .. .. .. ..
   2 C110 .. .. .. .. .. .. .. ..
   3 C118 .. .. .. .. .. .. .. ..
   4 C120 .. .. .. .. C2 00 .. ..
   5 C128 .. .. .. .. .. .. .. ..
```

Fig 2:$AB1E string data

```
C200 50 52 4F 4F 46 52 45 41
C208 44 45 52 53 20 52 55 4C
C210 45 2C 20 4F 51 20 3F 0D
C218 00 .. .. .. .. .. .. ..
```

BASIC Runner:for Routine 1

```
10 FORI=0TO7:POKE248+I,0:NEXT
20 INPUT"ROW SIZE (BYTES)";SZ:POKE250,SZ
30 INPUT"SUB 1 (ROW)";S1:POKE252,S1
40 INPUT"SUB 2 (COL)";S2:POKE248,S2
50 SYS49152
60 PRINTPEEK(248);PEEK(249)
```

Routine 1:Word array

```
C000 LDA$F8    :multiply sub2 for
C002 ASL       :word-length elements
C003 STA$F8    :
C005 LDA$F9    :
C007 ROL       :
C008 STA$F9    :
C00A LDA#$00   :clear product area
C00C STA$FE    :
C00E STA$FF    :
C010 LDX#$11   :perform 16-bit mult
C012 CLC       :of sub1 * row size
C013 ROR$FF    :
C015 ROR$FE    :
C017 ROR$FD    :
C019 ROR$FC    :
C01B BCC$C02A :if bit=0 then count-1
C01D CLC       :if bit=1 then add
C01E LDA$FA    :multiplicand to
C020 ADC$FE    :partial product
C022 STA$FE    :
C024 LDA$FB    :
C026 ADC$FF    :
C028 STA$FF    :
C02A DEX       :
C02B BNE$C013 :loop if X>0
C02D LDA$FC    :else add in sub2
C02F CLC       :
C030 ADC$F8    :
C032 STA$FC    :
C034 LDA$FD    :
C036 ADC$F9    :
C038 STA$FD    :
C03A LDA$9E    :add base address
C03C CLC       :from $9E/$9F (158/159)
C03D ADC$FC    :store in $F8/$F9
C03F STA$F8    :
C041 LDA$9F    :
C043 ADC$FD    :
C045 STA$F9    :RTS at C047 if wished
```

Footnote: Those who were puzzled by an incorrect instruction in Routine 3 of the August Machine Language column might like to know that CO2F should in fact read BPL$CO2A.

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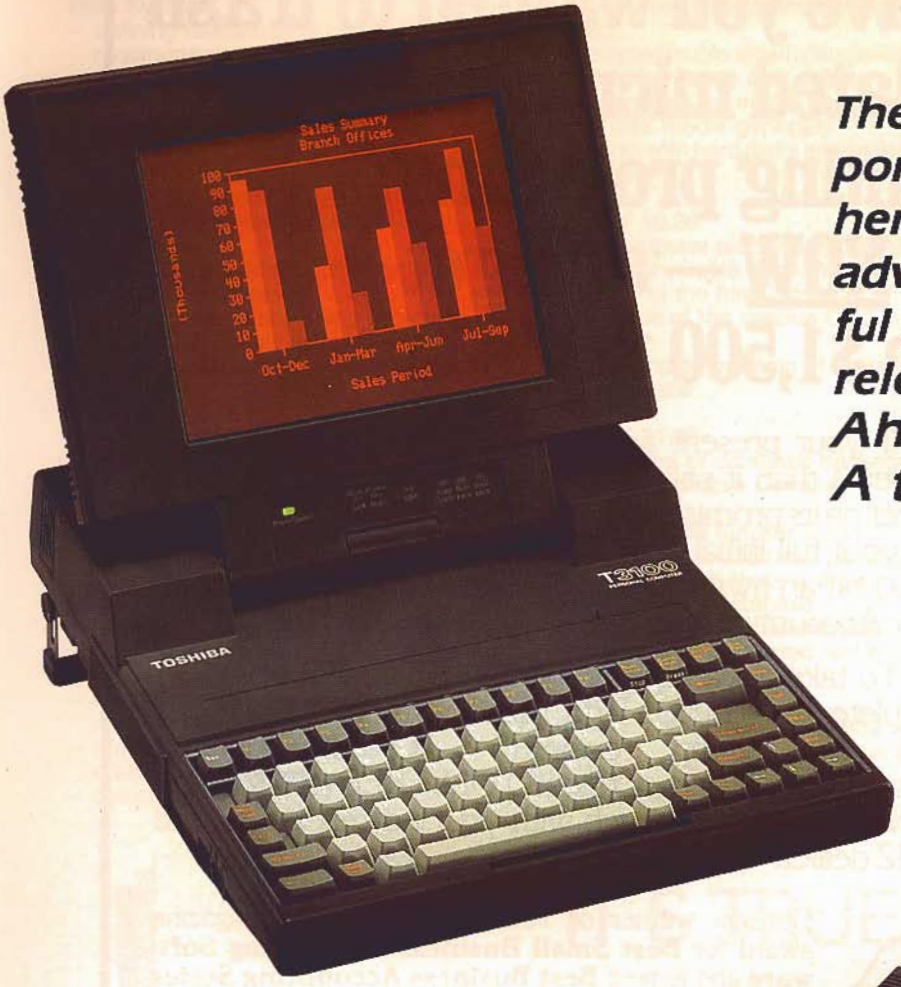

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Getting started on the Atari ST

by Allan Clark

It all started with the message, "It's arrived," and after a quick trip to Henderson I was unpacking my 1040ST. With only two power plugs, for the colour monitor and computer itself, no RF modulator output, and a built-in double-sided double-density disk drive, physically it was all I had read about.

Two disks were provided with the Atari, so first following the instructions in the brief manual I made back-up copies, very quickly getting to grips with the use of the mouse, windows and the GEM operating system. The language disk included Basic, Logo and Neochrome, while the second disk contained First Word word processing.

Loading Basic I quicky learned more about windows, of which it uses four – List, Output, Command and Edit. Both the Basic and Logo manuals provided with the 1040ST were in German, and while the local Atari user group came to the rescue with an English Basic manual, I have had to rely on magazines for details on how Logo works. The Basic language included menu functions found only in the more advanced 8-bit Basics, but the manual was very much a reference document, providing little detail on how to interface with GEM, and other sources will have to be consulted for this detail.

An annoying feature of the edit window was that when a line was entered or an existing one changed, the line went a dull grey, difficult to read. The ghost mode can be turned off with POKE SYSTAB+2,0 in the command window.

Neochrome is a graphics drawing program which allows the use of up to 16 colours on the screen. No instructions were provided, so it was a case of experimenting to find more functions; for example to load a saved picture, click on the disk icon with the right button.

The use of folders takes the place of directories found on other systems. To automatically load a program on booting a disk, create a folder called Auto and place it in the program you wish to load, and provided it has a .PRG extender it will be executed on booting the disk. The order of execution is the order programs appear in the folder.

Once you purchase an ST you will be thirsty for knowledge and details on how to use it. *Compute* and *Antic* magazines have announced new publications dedicated to the ST, while *Analog, Atari User Analog, Compute, Byte* and *Page Six* all have extensive ST sections. Abacus Books has released 12 books on the ST and Compute Books four, so there is a large amount of information becoming available for the model. *Analog* for July gave a full list of software for the 1040ST, but the August *Compute* warned that the ST is an easy computer to program and so a wide range of software is available. Much of it is very good, but to avoid being disappointed by some of the turkeys that do exist, you should have a demonstration of the software before buying.

If you wish to use the ST for more than application software you will need more information than is in the manuals. A good contact is your local Atari user group, which may not have many ST owners but its library will include *Antic* and *Analog* with lots of ST information and type in Basic, Logo ABD C programs.

For those who don't like GEM as an operating system, not liking dragging and pointing a mouse, DOS-Shell provides all the standard DOS commands while C-Shell provides the Unix commands. Attaching a printer to the ST is a matter of plugging it into the printer port, and if it's an Epson graphics compatible, pressing the Alternative and Help keys together will give a printout of the screen.

For adventure gamers I recommend The Pawn. This game is considered by many to be a classic, and makes excellent use of the ST's graphics capabilities commands. Coming from England, this program highlights the large amount of high-quality ST software coming out of Europe.

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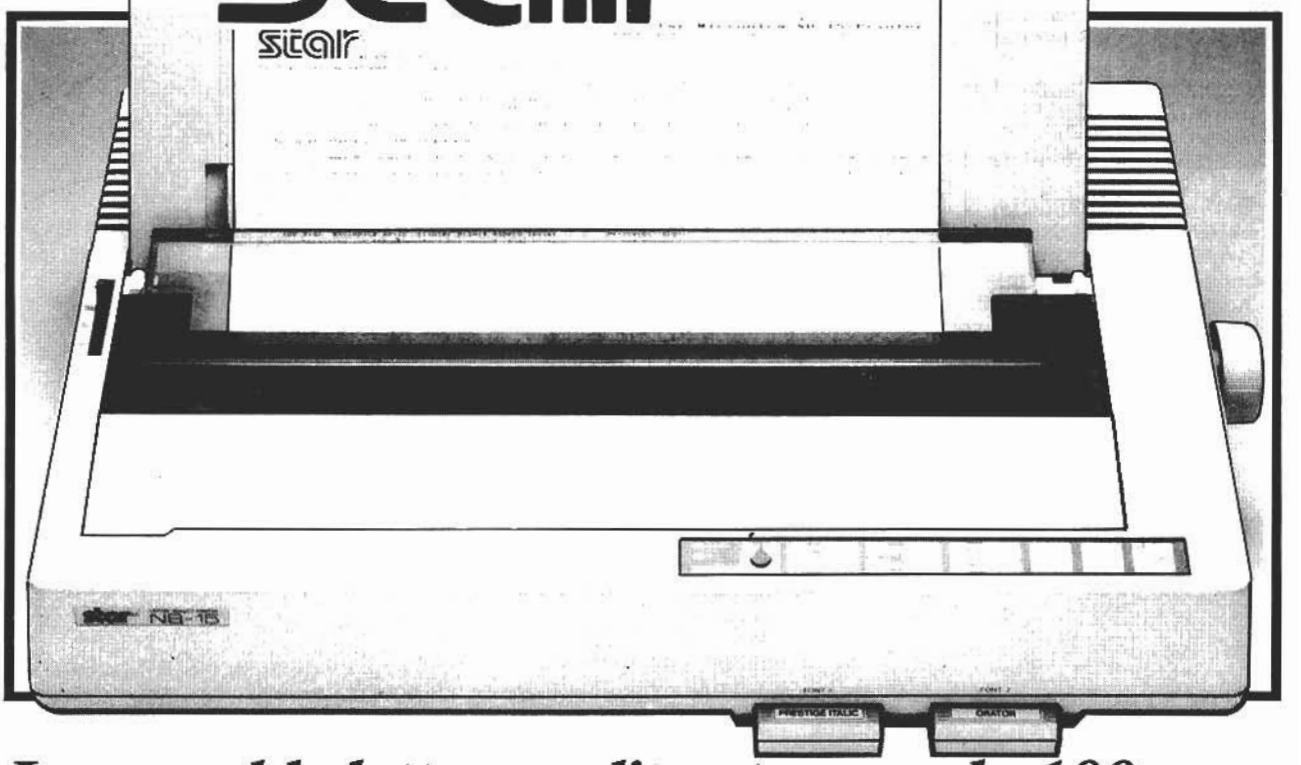

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The enigma of the 512

by Pip Forer

This, as they say in *Byte*, is a product preview of the 512 internal coprocessor for the BBC Master series, not a full review. (Tight schedules and delayed documentation mean that such items as benchmarking and in-depth testing couldn't get fairly done in the time.) With that single caveat in mind, let me describe what the Acorn 512 second processor for the BBC Master series has to offer, on the basis of having had access to one over a period of three weeks.

As many of you will know, the 512 is an internal upgrade for the BBC featuring a mouse, an Intel 80186 chip and 512k RAM. Most significantly it runs the DOS Plus operating system from Digital Research. This gives it a degree of compatibility with much of the 16-bit software designed to run on IBM-PC style machines. In practice this opens the way to using a selection of significant 16-bit software, but not using programs which are very hardware specific to PC clones.

The actual 512 system is installed very easily. A single card about 14 by 20 cm in size, with two sets of prong-like pins plugs into the sockets to the left-hand side of the Master motherboard. The mouse (which, for those into the great button debate, has three buttons) goes into the 1 MHz bus. A DOS Plus boot disk goes into the disk drive. If the Master is then configured to access the 512, the system automatically boots into DOS Plus in 80-column text and graphics mode, a process taking 10 to 20 seconds. So far, full marks for easy installation.

DOS Plus is a Digital Research (DR) operating system. It offers some extended features, but performs the same functions as some of the components of DOS/ADFS and MOS on the Master. It is one of DR's answers to the success of Microsoft's MS-DOS used by the IBM-PC.

In the early days of PCdom, MS-DOS and DR's CPM-86 were neck-and-neck for popularity, and many vendors packaged both operating systems with their machines. However, in spite of the large CP/M 8-bit base and initially better communications options, CPM-86 slowly faded. DR fought back with Concurrent CP/M, allowing several programs to run at once. When this proved inadequate they joined the band they couldn't beat by creating DOS Plus, which offers compatibility with both CPM-86 and MS-DOS commands, plus some enhancements to both. In theory, programs which are written using standard calls to MS-DOS will run unaltered under DOS Plus. The system boot procedure terminates with a screen prompt familiar to all MS-DOS users: A>.

DOS Plus on the 512 is a whole new world to an established BBC programmer. The BBC version makes a few concessions to this, having various common BBC commands such as MODE implemented as command files on the boot disk. The 512 also comes complete with the GEM environment, the reason for the mouse. GEM uses icons and windows to create a more friendly user interface in the manner of the Macintosh. The 512 comes complete with GemDraw and GemWrite, a sketch program and a word processor. Running under GEM, the BBC defaults to the 2-colour mode 0, which gives a good neat screen. Running either the bare DOS Plus or the GEM interface the system performs well, and the screen handling is surprisingly quick and slick, presumably reflecting the fact that the I/O processor (the Master itself) handles all of this.

The real question is, who will buy the 512? I must admit it would not be me, but I have confessed in *Bits & Bytes* my own discordance with the times by not liking MS-DOS, 16-bit machines of the Intel persuasion or GEM (which under MS-DOS is a real sow's ear job). However, since such systems quite clearly appeal to many buyers, a better answer is needed than my own prejudices. What are the markets for the 512?

At present it needs local disks, and some of the bundled software actually assumes double drives. This means it is not a simple upgrade for a network machine in a school, although rumours persist that such an option is coming. Nor is it a cheap way to get an IBM clone.

Firstly, in both hardware and screen handling it is not a PC clone. Secondly, even if it were, there are clones which would be much cheaper than the Master plus disks plus 512. Nor, it must be said, is the system all that much better in competition for the average business user when matched with less radical alternatives such as the Apricot or Olivetti. It has some speed advantages over many true PC clones, but this is unlikely to be enough to win it customers, especially since Acorn is marketing its own PC clone. It therefore has to aim at more confined markets where the BBC's strongest features are important.

The obvious situation is one where processing power suitable for administering a small business is required, especially where BBC compatibility is an advantage, either because the basic systems are being used elsewhere in a business or because some BBC software or hardware is especially useful.

This is not so much your simple 'ledger and accounts' situation, but in cases where the BBC's features have something special to offer. It could be access to educational software for the kids, or it could be advanced interfacing or access to a teletext mode. It is easy to forget how impressive the BBC's interfacing capabilities are, and while they can be matched by plug-in cards on other machines, this is never quite as cheap or as well integrated a solution.

There may also be situations where there is a need to use the BBC as a BBC for part of the time, or there is both software and hardware that has wide value, perhaps for training or interfacing, that is not available or as cheap on alternatives. In education, a machine able to use powerful administrative software but be compat-

ible with chalk face machines in the classroom might be useful. For all of these options the 512 looks a good, low-cost configuration.

The 512, however, is unlikely to be a widely used hacker's machine, or one used for programming in businesses or schools, except perhaps for BBC BASIC freaks wanting large programs, as it does offer greater memory space and a more standard 'professional' operating environment at lower cost than the far more impressive Scientific upgrade. Its strength will be in the ability to run a lot of good business software with links to a BBC environment. I understand that DbaseII and Microsoft Windows (a somewhat more acclaimed cousin to GEM) are both available for the 512, as an indicator of what may be compatible.

One of the neatest features of the Master series is undoubtedly the editor built into the 1 megabit ROM. This has a lot of useful editing features (you find there are even more than you suspect when you actually get a copy of the Reference Manual part 2). Used along with the LIST IF command, EDIT can do most of the things Toolkit can do, and many more it cannot.

However, there is one hiccup BASIC programmers should be aware of. I became puzzled when using EDIT to find that on one or two occasions when returning to BASIC my program had shortened dramatically (i.e. the last third or so had disappeared). After a while the truth dawned. The break always came where I had extended an already long program line. It seems that when EDIT converts back to BASIC, such lines may exceed the permitted entry line length in BASIC. This generates a condition such that the program appears to stop at that line. If, like me, you go in for shaggy-dog one-liners, this phenomenon may be worth being aware of.

Coming up: an overdue look at the Prolog interpreter, some comments on accessing the Master's sideways RAM, and some insights into Acorn's venture into interactive video.

The main problem in the short run is its cost. If a network facility became available and prices dropped dramatically, then the 512 would be a very handy and economic way to have an MS-DOS environment as an alternative in a school without the need for a separate lab. With current costs this is less attractive, and hardware progress is suggesting that the time for MS-DOS as the cheap, enhanced programmer's environment may be passing rapidly.

Which raises an interesting final note to leave on, since Acorn is clearly pricing its 16- and 32-bit internal processors quite high as part of a deliberate marketing strategy. These processors both require learning a second operating system, not always openly linked to the underlying BBC MOS. At present only a relatively few users will buy them, for most wanting a more complex system will buy a purpose-built example. For someone wanting the power of the 32016, for instance, the Cambridge Workstation (with 4 megabytes and a hard disk), is far better value.

What then is Acorn's direction for the second processor? Given that most people want enhancement without changing their environment, is it just going to be a turbo for us all? Or are there 6502 compatible chips with large memory address ranges waiting to utilise the power of the second processor slot more easily?

Domesday (Continued from page 37)

the player is expensive, and it may be that the current hybrid player is not the best technical option. The software, too, is a good first attempt, but undoubtedly its range and interface will become more and more enhanced as research on browsing algorithms and intelligent books advances. However it is hard to imagine that these aspects will not improve rapidly as the worth of the systems becomes appreciated.

The concept behind Domesday is very far reaching, since for the first time large quantities of images and data can be held together. For publishers and knowledge workers, the media for communication will never be quite the same. And this really is just the start.

Domesday has one great limitation, in that it uses a fairly inflexible and centralised medium. Current disks have to be centrally mastered for reproduction, like an LP record, at some cost each time. A disk for use is published like a book, but this is going to change. Video disks that can write are on the way.

It heralds a breakthrough in how information about places is held

This year a system may cost over $35,000 and only handle images, but once it becomes cheaper and more flexible the path will be open to low-cost, individualised data bases that embody substantial quantities of high-quality visual data for the first time. Researchers, planners, the military, real estate agencies and tourist interests among others will provide the market to ensure that systems in this area emerge.

As prices drop and experiences grow, your family album may even find itself set up just the same way in 1996, just in time to save the world silver reserves. Meanwhile, the information on Domesday and its immediate successors will keep us fairly busy for now. Barson Computers, the BBC distributor, expects to have a full copy of Domesday and the Philips Laservision operating in New Zealand in January 1987.

(Incidentally, the capital of Albania is Tirana and Lake Kivu is the largest lake in Ruanda.)

In the drive seat

by Joe Colquitt

This month, I thought I'd start taking a look at some useful disk operations that hopefully will make your life with a disk drive more productive. The many small programs could be incorporated into your own programs, or made into one larger utility. In the context of the articles, a 'drive' is the machine, a 'disk' is a floppy diskette, and a 'sector', 'block' or 'page' = 256 bytes. For owners who haven't yet explored their drives, perhaps a little nudge will inspire you. Learning at least the basics of operations wil pay off.

There are so many aspects of disk usage to cover that the directory seems to be the most sensible place to start. Memory maps of the various tracks on the disk can be found at the end of the manual that comes with the 1541 drive.

Most disk operations involve the directory. Every program or file needs its name in the directory for the computer to access it. These are held on track (T) 18, in sectors (S) 1 to 19. All file communication with the disk involves track 18 sector 0. The system must find out if the disk is compatible with the drive, and it's no good trying to use an MSDOS disk with a 1541, for instance. The way the drive does this is to look at byte 2 on T18, S0. A sector on the disk can, in the drive's own style, be POKED and PEEKED like ordinary memory. When you think about it, a disk is just a large chunk (170Kb or 340Kb if you turn the disk over) of memory that doesn't change when the power is turned off.

If the drive finds an 'A' (CHR$(65)) in byte 2, it recognises the format as 1541, and will allow communication. This can be used to advantage, as the byte is looked at before a save, but not a load. Changing it to anything else will prevent a save from taking place. Program 1 shows how this is done, and introduces some instructions that casual operators are probably not familiar with. Program 1 will write-protect your disk against any future saves.

A couple of points about its use: if you use it on a games disk, any high score, game position etc. cannot be saved to the disk; and software write-protect will not prevent reformatting. It can be handy, though, if you've run out of metal tabs. The way the program works is as follows:

Line 10: open channel1 and initialise drive
Line 20: open a buffer and channel2
Line 30: read the block T18 S0 off the disk and into the buffer associated with channel2
Line 40: set the Block Pointer to byte 2 in channel2 buffer
Line 50: set the new value for byte 2
Line 60: print it into the buffer
Line 70: write the block in the buffer back to T18 S0.
Line 80: close channels

As you can see, Block-Read (U1, UA or B-R) and Block-Write (U2, UA or B-W) are powerful commands. If you read my recent article on In/Out, you'll have seen an (inefficient) address change program that used Block-Read. A modified version of this will appear in a later issue, as will deeper study of other Block commands. Any block can be altered using the format of Program 1, if you know the track and sector, and the location of the byte(s) to change. The syntax for the three B-commands used is as follows:

B-R (U1,UA) "B-R channel drive T S" or
"B-R"; channel; drive;T;S;
B-W (U2,UB) as per B-R
B-P "B-P channel byte" or
"B-P"; channel; byte

The byte refers to the address (0-225) of the byte in the block you are looking at. In program 1, byte 2 is being changed via channel 2, thus "B-P 2 2". When setting the B-P before a B-W, B-P is put back to byte 0 so that a complete block of 256 is written to the disk. That shows how the drive POKES a new value into byte 2, in this example by changing a block in the buffer.

But what if you want to unprotect the diskette? By write-protecting it, you cannot alter the disk by writing to it. So the puzzle is... how do you write to a write-protected disk to tell it to un-protect itself?

The answer lies, not in the seaweed, but by placing instructions in the drive's buffer, which being hardware is not write-protected. The drive acts on these direct instructions and is fooled into writing the 65 back onto the disk. Program 2, courtesy of Chris Hardy, is the listing of this solution. As mentioned, you need to box clever to fool the drive.

Lines 10-40: as per Program 1, except that a specific buffer is opened as each buffer has a page0 byte.
Line 50: write 18 0 into the page0 pair 8/9
Line 60: write 128 into page0 byte 1, the byte to hold commands for buffer 1
Line 70: write 65 into byte 2 in the buffer
Line 80: as per Line50
Line 90: write 144 into page0 byte 1
Line 100: close channels

Although it looks complicated, the technique is similar to that used for autoruns, dynamic keyboarding and the like. Line60 writes 128, the command to read a block. The drive's interrupt system detects the 128 and the block T18 S0 is read. 144 is the command to write a block, written in Line90. By interrupt detection again, the write block is actioned. The program bypasses the normal syntax and communication routines, and control passes to the write block routine at $D464 in the DOS ROM. In this way, the usual check for 'A' at $D530 is not done and the write-protect can be removed.

Program 2a does the same job in a different way. It actually makes use of 'check A', writing an 'A' (line40) into $0101 (part of the stack) which is looked for when a save is attempted. As in all areas of computing, there's more than one way to skin a cat (sorry felinophiles).

M-R and M-W are two Memory-commands useful for working with the DOS itself, as shown by Program 2. The drive is silimar to the C64 in its organisation. There is ROM (that can be called), RAM (that can be written to or read) and there are work-

spaces that the DOS uses. In the C64 these would be locations like the keyboard buffer, border/background/ text colour bytes, etc. The DOS stores important values in the first few pages of its memory map, all accessible by the user, to read or change. A good example is Program 2, which made the drive do what it normally wouldn't.

The syntax for M-W and M-R is:

M-W "M-W"CHR$(lo)CHR$(hi) CHR$(n)CHR$(data1)CHR$(data2)...

where 'lo' and 'hi' are the receiving address in DOS, and 'n' is the number of data bytes being sent. In program 2, Line50 sets address to $08, and sends two bytes (18 and 0). The result is that DOS address $08 contains 18, and address $09, 0.

M-R "M-R"CHR$(lo)CHR$(hi)... <CHRS(n)>

Again, 'lo,hi' is the target address, and without the optional 'n', will read one byte from DOS using GET#. If 'n' is used, a string of consecutive bytes can be obtained from DOS. Program 3 illustrates how M-commands are used in a short program which returns the disk name, ID, and blocks free. It is not necessary to read the directory for this information, as it is stored in DOS RAM when a disk is initialised. Assigning the values obtained to an array would allow you to catalogue a set of disks.

Program 1: protect disk

```
10 OPEN1,8,15,"I0"
20 OPEN2,8,2,"#"
30 PRINT#1,"U1 2 0 18 0"
40 PRINT#1,"B-P 2 2"
50 A$=CHR$(66)
60 PRINT#2,A$;
70 PRINT#1,"U2 2 0 18 0"
80 CLOSE2:PRINT#1,"I0":CLOSE1
```

Speaking of "I0", Line40 of Program 3 shows the other M-command, M-E, in operation. M-E can be likened to SYS. The CHR$() are the lo/hi address. Line40 is effectively SYS53314 ($D042) to the 'read BAM' routine in DOS, part of 'initialise'. The LED doesn't light because not all of 'initialise' is called. On the other hand, try "M-E"CHR$(10)CHR$(230). M-E can be used in other ways, for example by calling ML in a buffer written to by M-W or down-loaded from a disk.

Program 4 only serves to show (albeit in BASIC) how a ML monitor like Drivemon disassembles DOS ROM. The particular routine broken down here is 'Validate' at $ED84. The numbers obtained would be passed to a disassembly routine for output as machine-code mnemonics.

This article came from the pen of Joe Colquitt. If you would like other disk utilities, write to me in my pen at 6 Martin Ave, Mt Albert, Auckland.

Program 2: unprotect disk

```
10 OPEN1,8,15,"I0"
20 OPEN2,8,2,"#1"
30 PRINT#1,"U1 2 0 18 0"
40 PRINT#1,"B-P 2 2":PRINT#2,CHR$(65);
50 PRINT#1,"M-W"CHR$(0)CHR$(0)CHR$(1)
   CHR$(18)CHR$(0)
60 PRINT#1,"M-W"CHR$(1)CHR$(0)CHR$(1)
   CHR$(1,0)
70 PRINT#1,"M-W"CHR$(0)CHR$(0)CHR$(2)
   CHR$(18)CHR$(0)
80 PRINT#1,"M-W"CHR$(1)CHR$(0)CHR$(1)
   CHR$(144)
90 [illegible]:PRINT#1,"I0":CLOSE1
```

Program 2a

```
10 OPEN1,8,15,"I0":OPEN2,8,2,"#"
20 PRINT#1,"U1 2 0 18 0"
30 PRINT#1,"B-P 2 2":PRINT#2,CHR$(65);
40 PRINT#1,"M-W"CHR$(1)CHR$(0)CHR$(1)
   CHR$(65)
50 PRINT#1,"U2 2 0 18 0":CLOSE2:CLOSE1
```

Program 3: read name,ID,free blocks

```
20 PRINT"INSERT DISK, PRESS A KEY"
25 WAIT198,1,M
30 OPEN1,8,15
40 PRINT#1,"M-E"CHR$(66)CHR$(208)
50 PRINT#1,"M-R"CHR$(144)CHR$(7)CHR$(16)
60 [illegible]
70 IN$="NAME : "A$
80 [illegible]
90 [illegible]
100 [illegible]
110 [illegible]
120 [illegible]
130 [illegible]
140 [illegible]
150 [illegible]
160 [illegible]
170 PRINTASC(A$)+256*ASC(B$)
180 CLOSE1
```

Program 4:read DOS ROM V0 command

```
10 OPEN1,8,15
20 FOR I=0TO46
30 PRINT#1,"M-R"CHR$(132+I)CHR$(237)
40 [illegible]
50 [illegible]
60 NEXT
70 CLOSE1
```

THE TYPE UTILITY: Part 2

Use of multiple input/output devices

by Evan Lewis, Ph.D.

In Part 1 a BASIC program designed to read sequential files and display their contents was described (page 49, August issue). This involves the use of two alternatives for the input device (disk or tape) and two alternative output devices (screen or printer). Only one input file number (8) and one output file number (4) are used, however.

The central module in the program is a loop which gets one character at a time from the input file using the statement GET#8, A$ and then sends it to the output file by PRINT#, A$.

Since the input file can be either on disk or tape, two alternative subprograms are provided to open either device (lines 370 and 390), e.g. to open the tape drive:

380 close 8: open 8, 1, 0, fi$: return

where fi$ is the filename.

The OPEN statement for disk files is similar, but the file type ("seq" or "prg" stores as ty$) and the direction of data transfer (read) are specified. Also the disk error channel is opened. After opening, the error channel is read and errors such as 'file not found' are displayed:

```
395 close 8: close 15
400 open 15, 8, 15: rem "Open disk error channel"
405 open 8, 8, 8, fi$ + "," + ty$ + ",read"
410 gosub 655 error trap
415 return
```

Notice that remarks can be written directly following GOSUB or GOTO statements as the BASIC interpreter does not read beyond the last numerical digit.

In each case the same file number (8) is used so that a single GET statement will work equally well whether the file happens to be on disk or tape.

The same technique is used for output which can be directed to either the printer or screen. The two subprograms at lines 330 and 345 are provided to open the output file. Normally output to the screen is made by PRINT statements without setting it up as an output file, because the screen is the default output device and all output is sent there unless some other device is specified.

But there is nothing to stop us specifying that output is to file number 4 by using PRINT#4... and opening the screen (device number 3) as file 4.

That may seem a strange thing to do, but it means that we now have control over where the output goes, by telling the computer that output file 4 refers to the printer, if we want printed output, or alternatively we can set up file 4 as the screen. That way the only thing that is affected by the choice of output device is the choice between two subroutines for opening the output file. There is no need to duplicate all of the print statements in the program to provide a choice between PRINT and PRINT#4. Instead PRINT#4 is used throughout. (In this program PRINT#4 is not used very extensively but the general applicability of this method can be seen.)

The four subprograms provided for opening the input/output (I/O) files all begin by closing the file first so that errors are not generated if the file is already open. That also allows the alternative open subroutine to be executed at will to switch back and forth between output options. The current output device is the one most recently opened.

Although it is not used in the TYPE program, it may be of interest that the default input device, as far as the computer is concerned, is the keyboard (device 0). Like the screen, the keyboard can be assigned to a file number using the OPEN statement. The INPUT# can be used to get characters from that 'file'. When INPUT# is used in this way it does not display a question mark and it is a convenient way of suppressing the question mark when it is not required. Text representing a question cannot be used with INPUT#, but it is a simple matter to display the question separately with a PRINT statement ending with a semicolon (;).

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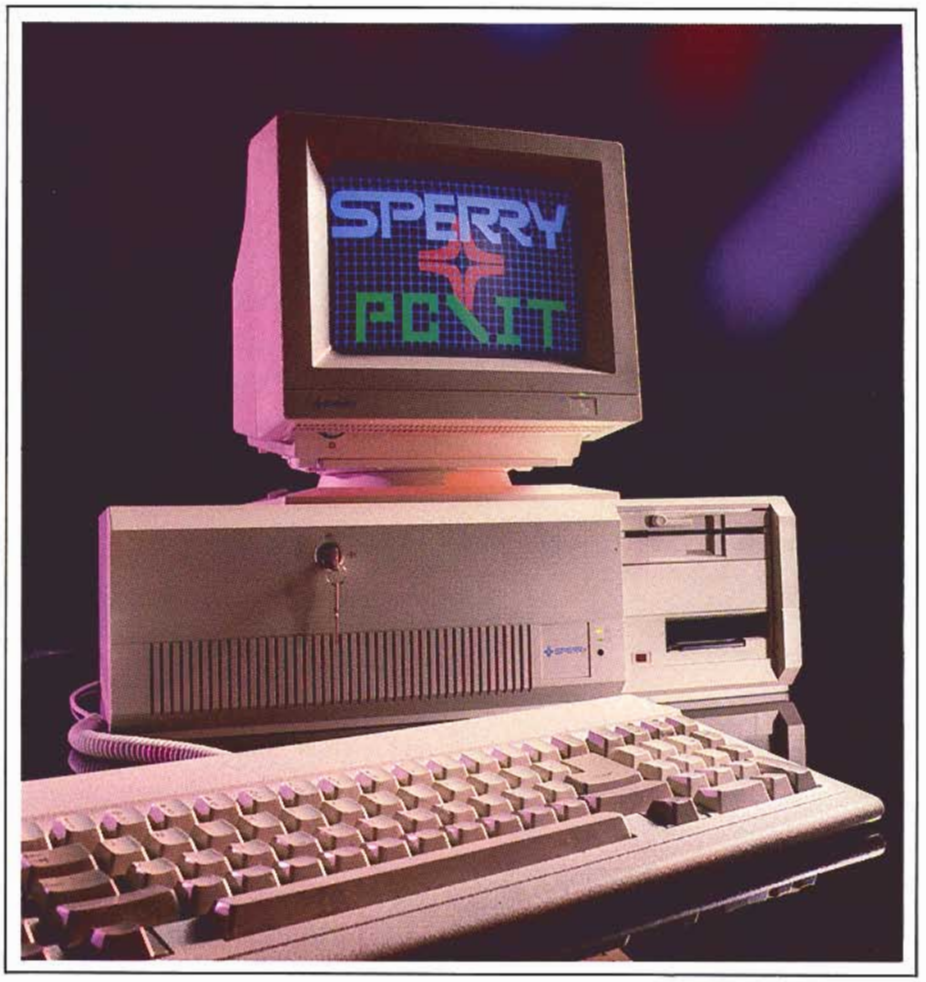

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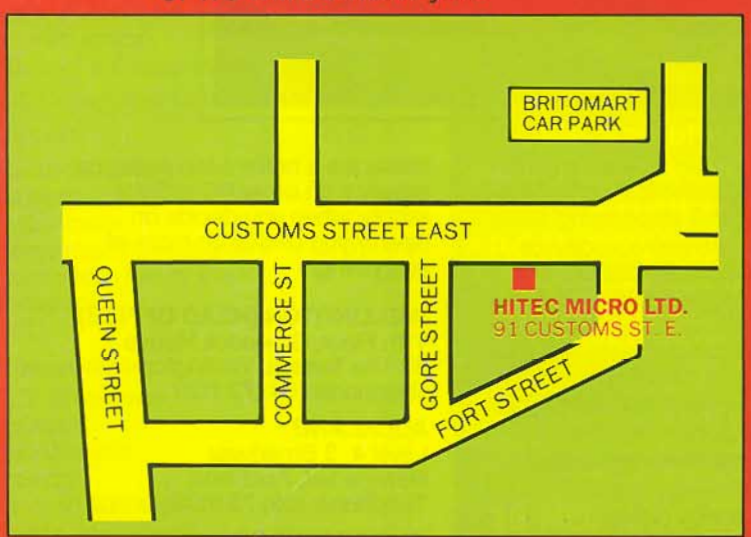

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